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(54) INTERMEDIATE FILM FOR LAMINATED GLASS AND LAMINATED GLASS

(57)Abstract:
PROBLEM TO BE SOLVED: To obtain a laminated glass which maintains basic performance necessary for a laminated glass and little efflorescence in the peripheral part even in a high humidity atmosphere by forming an intermediate film comprising a plasticized polyvinyl acetal resin film having a specified or lower haze when the film is immersed in water.
SOLUTION: When the intermediate film for a laminated glass comprising a plasticized polyvinylacetal resin film having 0.3 to 0.8 mm thickness is immersed in water at 23° C, efflorescence of the film after 24 hours is controlled to ≤50 % haze. To obtain the haze value above described, sodium salts and potassium salts which cause the efflorescence and which are mixed from the source material are controlled to have ≤10 μm particle size and to give ≤50 ppm sodium concn. and ≤100 ppm potassium concn. in the intermediate film. To effectively prevent efflorescence at high humidity, compds. which can form complexes with sodium salts and potassium salts, and org. acids and amines compatible with the resin and the plasticizer are preferably added as dispersants.

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AIMS

aim(s)]
aim 1]An interlayer for glass laminates when it is an interlayer for glass laminates which consists
plasticized polyvinyl polyvinylacetal resin films and said 0.3-0.8-mm-thick interlayer is immersed in
** water, wherein Hayes of 24 hours after is 50% or less.
aim 2]The interlayer for glass laminates according to claim 1 whose particle diameter of sodium
in an interlayer is 10 micrometers or less.
aim 3]The interlayer for glass laminates according to claim 1 or 2 whose particle diameter of
ium salt in an interlayer is 5 micrometers or less.
aim 4]The interlayer for glass laminates according to claim 1, 2, or 3 whose sodium concentration
n interlayer is 50 ppm or less.
aim 5]The interlayer for glass laminates according to claim 1 whose particle diameter of potassium
in an interlayer is 10 micrometers or less.
aim 6]The interlayer for glass laminates according to claim 1 or 5 whose particle diameter of
assium salt in an interlayer is 5 micrometers or less.
aim 7]The interlayer for glass laminates according to claim 1, 5, or 6 whose potassium
centration in an interlayer is 100 ppm or less.
aim 8]The interlayer for glass laminates according to claim 1, 2, 3, 4, 5, 6, or 7 which is a thing
taining a compound which can form sodium salt and potassium salt, and a complex.
aim 9]The interlayer for glass laminates according to claim 1, 2, 3, 4, 5, 6, or 7 which is a thing
taining amine which is compatible in organic acid which is compatible in resin and a plasticizer,
in, and a plasticizer.
aim 10]The interlayer for glass laminates according to claim 1, 2, 3, 4, 5, 6, 7, 8, or 9 which is a
g containing at least one sort chosen from a group which consists of alkali metal salt and alkaline
th metal salt.
aim 11]The interlayer for glass laminates according to claim 10 whose alkali metal salt is a thing
a particle diameter of 3 micrometers or less and whose alkaline earth metal salt is a thing with a
ticle diameter of 3 micrometers or less.
aim 12]The interlayer for glass laminates according to claim 10 or 11 whose alkali metal salt is the
ali metal salt of organic acid of the carbon numbers 5-16 and whose alkaline earth metal salt is the
aline earth metal salt of organic acid of the carbon numbers 5-16.
aim 13]A glass laminate characterized by making the interlayer for glass laminates according to
m 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12 come to intervene between glass of a couple at least.

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TAILED DESCRIPTION

tailed Description of the Invention]
01]
id of the Invention]This invention relates to the glass laminate which used the interlayer for glass
inates, and the above-mentioned interlayer for glass laminates.
02]
scription of the Prior Art]The glass laminate with which it comes conventionally to fasten the
erlayer which consists of a plasticization polyvinyl butyral between the glass plates of at least two
ets, It has basic performance transparency, weatherability, and an adhesive property are good,
d penetration resistance moreover and required for the glass laminate of a glass fragment not
persing easily, for example, is widely used for the windowpane of a car or a building.
03]This kind of glass laminate is inferior in moisture resistance, although the above-mentioned
ic performance is good and excellent in safety. That is, by the periphery of a glass laminate, when
above-mentioned glass laminate is placed into a humid atmosphere, since the interlayer touches
ironmental air directly, the problem which the interlayer of a periphery milks arises.
04]The additive agent for performing adhesive strength adjustment of an interlayer and glass
cribed below is participating in this albinism. In order to demonstrate the function as the above-
ntioned glass laminate enough, it is required to adjust the adhesive strength of an interlayer and
s so that it may fall within a proper range. Namely, if the danger of the glass fragment damaged by
shock from the outside, etc. separating and dispersing from an interlayer, and doing injury to a
nan body etc. if the adhesive strength of an interlayer and glass is too weak becomes high and the
esive strength of an interlayer and glass is too strong conversely, Glass and an interlayer are
ultaneously damaged by the shock from the outside, etc., and the danger of the adhesion fragment
glass and an interlayer dispersing and doing an obstacle to a human body etc. becomes high.
05]On the other hand, when there is adhesive strength of an interlayer and glass within proper
ts. Since the phenomenon in which partial interfacial peeling of an interlayer and glass happens,
an interlayer extends arises at the same time glass is damaged while glass breakage reaches far
wide and happens, the impact-absorbing effect and a penetration preventive effect become large.

06]Therefore, in case of the accident of transport-airplane machines, such as a car, In order to
orb a shock in case a driver and a passenger collide to glass or to prevent penetration, in case of
accident of a building, In order to prevent the missile from the outside from penetrating glass or
prevent scattering of a glass fragment, it is required to adjust the adhesive strength of an
erlayer and glass so that it may fall within a range proper like ****.
07]In order to adjust the adhesive strength of an interlayer and glass within proper limits
ventionally in view of the above, the adhesive strength regulator for interlayers has been
mined variously. In JP,46-4270,B, the interlayer for glass laminates which consists of a polyvinyl-
tal resin composition which carries out specific amount content of 0.2 to 0.8 % of the weight of
isture and the metal alkyl carboxylate specific as an adhesive strength regulator is proposed. The
erlayer by the above-mentioned proposal tends to adjust the adhesive strength of an interlayer
glass to the proper range by changing the distribution quantity of metal alkyl carboxylate in an
erlayer layer part and an interlayer inner layer part, or changing the moisture content in an
erlayer.
08]However, the interlayer containing metal alkyl carboxylate like the above-mentioned proposal,

Since the interlayer is carrying out direct contact to air in the periphery of the glass laminate if the glass laminate which moisture resistance fell and was manufactured using this interlayer is neglected under a humid atmosphere, While the quantity of metal alkyl carboxylate increases, there is a problem that the albinism by moisture absorption of an interlayer happens violently. Although it can prevent whether the albinism of the above-mentioned interlayer reduces the quantity of metal alkyl carboxylate as much as possible, and by losing, in that case, the fatal problem as a glass laminate of the adhesive strength of an interlayer and glass becoming stronger than the proper range too much, and glass and an interlayer being simultaneously damaged by the shock from the outside, etc., or becoming easy to penetrate had occurred.
[0009]In JP,44-32185,B, contain 0.1 to 0.8% of moisture, and The monocarboxylic acid of six to 22 carbon atom, The dicarboxylic acid of four to 12 carbon atom, and the aliphatic series monoamino monocarboxylic acid of two to 6 carbon atom, The interlayer for glass laminates which carries out 0.01-3 weight-section content of the aliphatic series monoamino dicarboxylic acid of four to 5 carbon atom and at least one organic acid chosen from citrate and these mixtures per resin 100 weight section and which consists of shaping polyvinyl-acetal resin is proposed.
[0010]However, when carboxylic acid is added, there is a problem that adhesive strength changes with time. The problem that the heat resistance and the weatherability of an interlayer fall under the influence of acid arises.
[0011]In the glass which pasted the glass of at least two sheets together with the plasticized-polyvinyl-acetal-resin constituent in JP,48-5772,B, The glass laminate making sodium metal salt of the aliphatic carboxylic acid of the carbon numbers 10-22 contain in this plasticized-polyvinyl-acetal-resin constituent is proposed.
[0012]In JP,53-18207,B, using the alkali metal salt or alkaline earth metal salt of monocarboxylic acid or dicarboxylic acid is proposed as an adhesive strength regulator in the plasticized-polyvinyl-acetal-resin interlayer of a glass laminate.
[0013]In the two above-mentioned proposals, each uses metal salt of carboxylic acid with a comparatively large carbon number as an adhesive strength regulator from it being easy to dissolve in the plasticizer contained in an interlayer.
[0014]However, when metal salt of carboxylic acid with a large carbon number is used as an adhesive strength regulator, there is a problem that the adhesive strength of an interlayer and glass changes with time progress (temporality). That is, even if early adhesive strength is proper, adhesive strength declines gradually with temporality, and when shocked, glass exfoliates easily. In order to prevent this adhesive strength fall, it is necessary to keep an interlayer for one to two months under 40-50 ** atmosphere, and to ripe, and. Since an interlayer has adhesiveness, autohesion nature, etc., even if keeping it under the above atmosphere for a long period of time ripes difficult actually, although the fall of adhesive strength with the passage of time can be controlled, it cannot be made for there to be nothing, but the above-mentioned problem will still remain.
[0015]In JP,60-210551,A, to plasticized-polyvinyl-acetal-resin 100 weight section, The glass laminate with which the glass of at least two sheets sticks, and it comes to unite it by whether 0.02 to potassium monocarboxylate 0.40 weight section and 0.01 to modified silicone oil 0.26 weight section whose carbon numbers are 1-6 contain, and the interlayer to which it adheres is indicated. However, since this metal salt solidified in particle state in the interlayer depending on the kind of metal salt used and this glass laminate caused a white blush mark, the perfect thing was not able to say from a viewpoint of preventing the white blush mark by long-term moisture absorption.
[0016]In JP,2-41547,B, the polyvinyl-butyral sheet which uses alkali or alkaline-earth-metals formate for an adhesive strength regulator is proposed. In the Patent Publication Heisei No. 502594 [six to] gazette, the interlayer which added potassium acetate as an adhesive strength regulator in the example is used.
[0017]In the three above-mentioned proposals, in order to cancel said problem in the case of using metal salt of carboxylic acid with a large carbon number as an adhesive strength regulator, metal salt of carboxylic acid with a comparatively small carbon number is used.
[0018]However, if metal salt of carboxylic acid with a small carbon number is used as an adhesive strength regulator, Although the problem of an adhesive strength fall with the passage of time of an interlayer and glass is canceled, the moisture resistance of an interlayer becomes insufficient and, as a result, another problem of becoming easy to start the albinism by moisture absorption to the edge

t (end) of a glass laminate occurs.
19]That is, since hygroscopicity is under the usual atmosphere (humidity), when processing it into lass laminate, it is common [an interlayer] to process it by controlling the humidity and doubling. example so that water content may be about 0.5 or less % of the weight under the atmosphere of RH. However, since the edge part of a glass laminate is in an unreserved state, under a high idity atmosphere, an interlayer absorbs moisture and water content usually rises to about 2 to 3% he weight. At this time, water gathers for the circumference of metal salt of carboxylic acid with a all carbon number of potassium acetate, magnesium acetate or potassium formate etc. which ts as a minute crystal in an interlayer, and albinism is caused. If the addition of carboxylic acid a small carbon number or its salt is decreased in order to reduce albinism, the adhesive strength n interlayer and glass will deviate from the proper range, and will become insufficient [impact- orption nature, penetration resistance, etc. of a glass laminate].
20]As a trial to improve, the white blush mark of the interlayer containing carboxylic acid metal in JP,5-186250,A. The interlayer for glass laminates currently formed from polyvinyl-acetal resin, plasticizer, and the resin composition in which aliphatic series mono- ** whose carbon number is or less contains the alkali or alkaline earth metal salt, and organic acid of dicarboxylic acid is posed.
21]The interlayer for glass laminates which becomes JP,7-41340,A from the resin composition taining polyvinyl-acetal resin, a plasticizer, carboxylic acid metal salt, and straight-chain fatty acid roposed.
22]However, the glass laminate using the interlayer for glass laminates of the above-mentioned posal is not still enough, although the white blush mark of the edge part after a humidity istance test is reduced. And when it is going to reduce a white blush mark further and the content straight-chain fatty acid is increased, and a glass laminate is placed under relatively high perature, there is a possibility of producing foaming and discoloration.
23]Although the interlayer of the above-mentioned proposal tries solution of a white blush mark improvement of an adhesive strength regulator, also in the interlayer which is not adding the esive strength regulator, the white blush mark by moisture absorption produces it. It became clear our latest research that the impurity in the resin described below is involving as one of the cause his.
24]Although the interlayer for glass laminates of this invention uses polyvinyl-acetal resin as the n ingredients, the neutralization process is included when manufacturing polyvinyl-acetal resin. ce the solution of sodium salt, such as sodium hydroxide and sodium bicarbonate, is used in this tralization process, for example. When those sodium salt is used superfluously and new sodium generates by neutralization, sodium salt remains in the polyvinyl-acetal resin obtained. s sodium salt that remained causes [big] a white blush mark by moisture absorption of the rlayer for glass laminates obtained in order to promote condensation of water, when it becomes ticle state at the time of a polymerization and desiccation and polyvinyl-acetal resin absorbs er. Sodium salt may remain also to polyvinyl alcohol and this sodium salt may cause a white blush k by moisture absorption of the interlayer for glass laminates.
25]In recent years, the motion which uses a glass laminate for side glasses and the various dings of a car prospers, in these uses, also when using the periphery of a glass laminate in the eserved state, it is increasing, and the request to albinism prevention is increasingly stronger.
26]
oblem(s) to be Solved by the Invention]The place which this invention solves the above- ntioned problem and is made into the purpose. Without spoiling basic performance required for s laminates, such as transparency, weatherability, an adhesive property, and penetration istance, even when moreover placed into a humid atmosphere, there is a white blush mark of a s laminate edge part in providing the interlayer for [little] glass laminates, and the glass laminate ng it.
27]
ans for Solving the Problem]This invention is an interlayer for glass laminates which consists of sticized polyvinyl polyvinylacetal resin films, and when the 0.3-0.8-mm-thick above-mentioned rlayer is immersed in 23 ** water, Hayes of 24 hours after is an interlayer for glass laminates ch is 50% or less. This invention is explained in full detail below.

[0028]When an interlayer for glass laminates of this invention immerses a 0.3-0.8-mm-thick interlayer in 23 ** water, Hayes of 24 hours after is 50% or less.
[0029]When this invention persons immerse a 0.3-0.8-mm-thick interlayer in 23 ** water, Even when Hayes of 24 hours after was placed into atmosphere where 50% or less of interlayer for glass laminates is humid, there were few white blush marks of a glass laminate edge part, they found out excelling in moisture resistance, and completed this invention.
[0030]Since it becomes insufficient to prevent a white blush mark under high humidity and it is inferior to moisture resistance when above-mentioned Hayes exceeds 50%, it is limited to a mentioned range. Above-mentioned Hayes as used herein shall mean a value which used and measured an integral equation turbidity metar 24 hours afterward, when a 0.3-0.8-mm-thick interlayer is immersed in 23 ** water.
[0031]An interlayer for glass laminates of this invention consists of a plasticity polyvinyl-acetal resin layer, and the above-mentioned plasticity polyvinyl-acetal resin layer uses polyvinyl-acetal resin as the main ingredients.
[0032]As the above-mentioned polyvinyl-acetal resin, average degree-of-acetalization% of a thing of 40-75 mol is preferred. compatibility with a plasticizer falling that it is less than [40 mol %], and mixing a plasticizer of a complement to reservation of penetration resistance --- hard --- ** --- there is a case. If 75-mol % is exceeded, while a mechanical strength of an interlayer for glass laminates obtained will fall, in order to obtain resin, prolonged reaction time is required, and it is not sometimes desirable on a process. It is 60-75-mol % more preferably. If it is less than [60 mol %], since hygroscopicity becomes high, a white blush mark will happen easily. It is 64-71-mol % preferably.
[0033]In the above-mentioned plasticized polyvinyl acetal resin, the following [30 mol %] have a preferred vinyl acetate component. Since it will become easy to cause blocking at the time of manufacture of resin if 30-mol % is exceeded, it becomes difficult to manufacture. Preferably, it is less than 19 mol %.
[0034]The above-mentioned plasticized polyvinyl acetal resin comprises a vinyl-acetal ingredient, a vinyl alcohol ingredient, and a vinyl acetate component, and each of these component amounts, It can measure based on for example, a JIS K 6728"polyvinyl-butyral test method" and a nuclear magnetic resonance method (NMR).
[0035]When the above-mentioned polyvinyl-acetal resin is except polyvinyl butyral resin, a vinyl alcohol component amount and the amount of vinyl acetate components can be measured, and the remaining vinyl-acetal component amounts can be computed by deducting both the above-mentioned component amounts from 100.
[0036]The above-mentioned polyvinyl-acetal resin can be conventionally manufactured by a publicly known method. for example, solution obtained by dissolving polyvinyl alcohol in warm water --- a predetermined temperature --- for example, it holds at 10-20 ** preferably, and 0-95 ** of acetalization reactions are advanced, adding and stirring a necessary acid catalyst and aldehyde. Subsequently, reaction temperature is raised to 70 **, it ripes, a reaction is completed, and a method of performing neutralization, rinsing, and desiccation and obtaining powder of polyvinyl-acetal resin, etc. are mentioned after that.
[0037]As polyvinyl alcohol used as the above-mentioned raw material, a thing of the average degrees of polymerization 500-5000 is preferred, and a thing of the average degrees of polymerization 1000-2500 is more preferred. When it is less than 500, the penetration resistance of a glass laminate obtained may fall. if 5000 is exceeded, shaping of a resin layer will carry out --- hard --- ** --- there are things and, moreover, intensity of a resin layer may become strong too much.
[0038]Since it is preferred to set a vinyl acetate component of polyvinyl-acetal resin obtained to less than 30 mol % therefore, a saponification degree of the above-mentioned polyvinyl alcohol has a preferred thing beyond 70 mol %. When it is less than [70 mol %], the transparency of resin and heat resistance may fall and reactivity may also fall. It is a thing beyond 95 mol % more preferably.
[0039]An average degree of polymerization and a saponification degree of the above-mentioned polyvinyl alcohol can be measured, for example based on JIS K 6726"polyvinyl alcohol test-method." As the above-mentioned aldehyde, aldehyde of the carbon numbers 3-10 is preferred. The moldability of resin layers with a carbon number enough by less than three may not be obtained. If 10 is exceeded, the reactivity of acetalization will fall, and moreover it will become easy to generate a block of resin during a reaction, and will become easy to follow difficulty on composition of resin.

40]It is not limited especially as the above-mentioned aldehyde, but For example, propionaldehyde, utylaldehyde, isobutyraldehyde, a valeraldehyde, Aliphatic series, such as n-hexylaldehyde, 2-ylbutylaldehyde, n-heptylaldehyde, n-octyl aldehyde, n-nonyl aldehyde, n-decyl aldehyde, zaldehyde, and a cinnamaldehyde, aromatic series, alicycle fellows aldehyde, etc. are mentioned. ferably, they are n-butylaldehyde of the carbon numbers 4-8, n-hexylaldehyde, 2-ylbutylaldehyde, and n-octyl aldehyde. Since adhesive strength of each resin layer becomes ng, and n-butylaldehyde of the carbon number 4 is excellent also in weatherability by use of yvinyl-acetal resin obtained and moreover becomes easy [manufacture of resin], it is more ferred. These may be used alone and two or more sorts may be used together.

41]In an interlayer of this invention, it is preferred that particle diameter of sodium salt in an rlayer is 10 micrometers or less, and it is 5 micrometers or less more preferably. About particle meter of potassium salt in an interlayer, it is preferred that it is 10 micrometers or less, and it is 5 rometers or less more preferably. The finer moderate still more desirable one of particle diameter r 0 is good.

42]Since condensation of water may be promoted when particle diameter of the above-mentioned lium salt exceeds 10 micrometers or particle diameter of potassium salt exceeds 10 micrometers, an become a big cause of a white blush mark by moisture absorption of an interlayer obtained.

43]Although particle diameter of the above-mentioned sodium salt and particle diameter of assium salt point out particle diameter in inside of an interlayer, Although particle diameter of lium salt in polyvinyl-acetal resin which is the main raw material, and particle diameter of assium salt may decrease in process of film production, As for particle diameter of sodium salt, l particle diameter of potassium salt, also in polyvinyl-acetal resin, since particle diameter may be d, it is preferred that it is in a mentioned range.

44]Particle diameter of sodium salt in the above-mentioned interlayer and potassium salt can be asured by imaging of a secondary ion image which used a time-of-flight type secondary-ion-ss-spectroscopy device (TOF-SIMS).

45]In an interlayer of this invention, it is preferred that sodium concentration is 50 ppm or less. ut potassium concentration in an interlayer, it is preferred that it is 100 ppm or less. More ferably, sodium concentration is 0.5 ppm or more 15 ppm or less, and potassium concentration is ppm or more 100 ppm or less.

46]Since it will grow up to be even a size by which a water molecule which gathered around a lium element and a potassium element is visualized if a sodium content in the above-mentioned rlayer exceeds 50 ppm and potassium contents exceed 100 ppm, a white blush mark may become narkable. Preparing an interlayer less than 0.5 ppm in any [of a sodium content in the above-ntioned interlayer, and potassium contents] case, Treatment which lengthens dramatically a cess of washing a residual sodium element or a potassium element, or raises the degrees of ning to be used, such as water and raw material, by preparation of resin may be needed, great e and expense may be required, and it may not be desirable practically.

47]Sodium concentration and potassium concentration in the above-mentioned interlayer can be ntified by ICP luminescence ultimate analysis. After the above-mentioned ICP luminescence mate analysis heats and decomposes a sample with sulfuric acid and nitric acid and sets the me of a decomposition product with ultrapure water, it is the method of quantifying by the ICP-S method.

48]Mixing of the above-mentioned sodium and/or potassium, For example, in order to neutralize acid catalyst of sulfuric acid used for a reaction, chloride, etc. in preparation of polyvinyl-acetal in, It originates in having used a neutralizer having contained a sodium element or potassium ments, such as sodium carbonate, sodium bicarbonate, sodium acetate, sodium hydroxide, assium carbonate, potassium bicarbonate, potassium acetate, and a potassium hydrate.

49]In a manufacturing method of the above-mentioned polyvinyl-acetal resin, a neutralization cess can prevent an acid catalyst like indispensable chloride (HCl) remaining in resin, and causing radation of resin itself in a generation reaction of polyvinyl-acetal resin which is a process before t.

50]As the above-mentioned neutralizer, alkali metal salt and alkaline earth metal salt can be used. n if alkaline-earth metals remain so much in an interlayer unlike an alkaline metal, they are ferred at a point which can control a white blush mark under high humidity.

[0051]As the above-mentioned alkaline earth metal salt, calcium salt, such as barium salt; calcium hydroxide, such as magnesium salt; barium hydroxide, such as aerated water matter magnesium, magnesium hydroxide, and basic magnesium carbonate, etc. are mentioned, for example.

[0052]Mixing of the above-mentioned sodium and/or potassium, When adding sodium salt or potassium salt, such as carboxylic acid and octylic acid, etc. as an adhesive strength regulator, a sodium element or a potassium element contains in used water, raw material, especially polyvinyl alcohol, etc., and it happens also by a case where these remain in an interlayer.

[0053]For example, an alkaline metal contained in the above-mentioned pure water can be reduced to 1 ppm or less by using ion exchange water. On the other hand, an alkaline metal contained in polyvinyl alcohol originates in sodium acetate generated in a manufacturing process of a polyvinyl alcohol raw material when saponifying polyvinyl acetate, and content is usually 0.4 to 1.5 % of the weight.

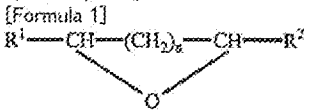
[0054]Therefore, when content of sodium acetate uses a polyvinyl alcohol raw material which is 0.4 or less % of the weight, sodium elements with difficult washing contained in resin can be reduced, it is stabilized by washing strengthening etc., and a sodium element can be 50 ppm or less.

[0055]In a manufacturing method of the above-mentioned polyvinyl-acetal resin, it can also carry out by rinsing polyvinyl-acetal resin, without performing the above-mentioned neutralization process, until it becomes pH five or more, and also drying below 60 **. By fully rinsing, alkali metal content leading to a white blush mark of a resin layer obtained can be held down to below the specified quantity until it becomes pH five or more. While preventing resin deterioration by mixing of an alkaline metal, and remains of an acid catalyst by [of 60 ** or less] drying at low temperature comparatively, corrosion by acid of a dryer can be prevented. Although a conventional method may be sufficient as a drying method, especially its vacuum-drying method is efficient, and excellent.

[0056]In the above-mentioned washing process, it is preferred to wash with not less than 40 ** water. It is for raising washing efficiency by temperature of water used at the time of washing being not less than 40 ** paying attention to resin in a slurry swelling above 40 **, and preventing resin deterioration by mixing of an alkaline metal, or remains of an acid catalyst. At the time of washing, by using 40-60 ** wash water preferably, resin in a slurry swells, and acid (HCl) incorporated into resin and its neutralized substance (alkaline metal inclusion) are flushed easily, and can raise washing efficiency by not less than 40 **. If wash water is lower than 40 **, resin will not fully swell but it will be hard to go up an effect. When wash water is more expensive than 60 **, while softening of resin may take place, particles may coalesce, formation of a block may be seen and a thing of stable particle diameter may not be obtained, improvement in a large effect cannot be expected as compared with 60 ** water, but it becomes useless also in energy.

[0057]In order to prevent mixing of the above-mentioned sodium and potassium, carry out the acetalization reaction of polyvinyl alcohol, a chloride catalyst, and the aldehyde, and it faces compounding polyvinyl-acetal resin, Polyvinyl-acetal resin can be obtained as a stop agent and a chloride remover of a reaction using epoxide, and a method of performing film formation can also be mentioned after that. It is expressed with following general formula (I) as the above-mentioned epoxide. [0058]

[Formula 1]



(I)

[0059](R^1 and R^2 express hydrogen or an alkyl group.) n expresses the integer of 0-3. 1,4-epoxide, 1,3-epoxide, such as trimethylene oxide, a tetrahydrofuran, and tetrahydropyran, 1,5-epoxide besides 1,2-epoxide, etc. are mentioned — these — one sort — or two or more sorts may be used together. Especially as epoxide, ethyleneoxide, propylene oxide, etc. are preferred.

[0060]As amount of the above-mentioned epoxide used, the effective dose which can perform stop of a reaction and chloride removal can be used. Degradation of resin by mixing of an alkaline metal and remains of an acid catalyst can be prevented by replacing the method of using the above-mentioned epoxide with the neutralizer of a chloride catalyst, and stopping an acetalization reaction using epoxide, and also removing chloride.

[0061]In this invention, as for an interlayer for glass laminates, in order to prevent a white blush mark

ler high humidity more effectively, it is preferred that it is what adds a dispersing agent. By adding above-mentioned dispersing agent, a sodium compound, a potassium compound, etc. which exist olyvinyl-acetal resin and a plasticizer can be distributed, and particle diameter of these elements be made small.

62]Amine which is compatible in organic acid, resin, and a plasticizer which are compatible in a pound which can form sodium salt and potassium salt, and a complex, resin, and a plasticizer as above-mentioned dispersing agent is mentioned.

63]The compound which can form the above-mentioned sodium salt and potassium salt, and a plex can control a white blush mark of an interlayer for glass laminates obtained, even if the ve-mentioned polyvinyl-acetal resin absorbs moisture, in order to make it hard to approach in er by carrying out hydrophobing of the circumference of metal salt, such as sodium salt and assium salt.

64]It is not limited especially as a compound which can form the above-mentioned sodium and assium salt, and a complex. For example, ethylenediaminetetraacetic acid, salicylaldehyde, salicylic d, Salicylanilide, oxalic acid, a 1,10-phenanthroline, an acetylacetone, 8-hydroxyquinoline, ethylglyoxime, 1,1-cyclohexane 2 acetic acid, salicylaldoxime, a glycine, etc. are mentioned. These be used alone and may use two or more sorts together.

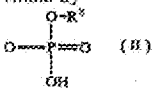
65]Although an addition of a compound which can form the above-mentioned sodium and assium salt, and a complex is based on quantity of metal salt which remains to polyvinyl-acetal in, it is preferred that they are 0.02 - the amount part of duplexs to the polyvinyl-acetal resin 100 ve-mentioned weight section. If a preventive effect of a white blush mark by moisture absorption become insufficient if it is less than 0.02 weight sections and the amount part of duplexs is ceeded, compatibility with the above-mentioned polyvinyl-acetal resin may become poor, and a blem may arise in transparency. It is 0.05 to 1 weight section more preferably.

66]As the above-mentioned dispersing agent, amine which is compatible in organic acid, resin, and lasticizer which are compatible in resin and a plasticizer can also be used. As organic acid which is patible in the above-mentioned resin and a plasticizer, polymer acid, such as monomer acid, such sulfonic acid, carboxylic acid, phosphoric acid, and nitric acid, polysulfone acid, and polycarboxylic d, etc. are mentioned, and sulfonic acid, carboxylic acid, and phosphoric acid are especially ferred. These may be used independently and may be used together two or more sorts.

67]It is using at least one sort more preferably from a group which consists of sulfonic acid whose bon numbers are 2-21, carboxylic acid whose carbon numbers are 2-20, and phosphoric acid ressed with following general formula (II) as organic acid which is compatible in the above-ntioned resin and a plasticizer.

68]

rmula 2]



(II)

69](R^3 expresses among a formula the aliphatic series system hydrocarbon group whose carbon bers are 1-18, or the aromatic system hydrocarbon group whose carbon numbers are 1-18.) R^4 resses a hydrogen atom, the aliphatic series system hydrocarbon group whose carbon numbers 1-18, or the aromatic system hydrocarbon group whose carbon numbers are 1-18.

70]In the sulfonic acid whose above-mentioned carbon numbers are 2-21, if a carbon number is s than two, When hydrophilic nature may become high, compatibility with polyvinyl-acetal resin warsen, distributing may become insufficient and a carbon number exceeds 21, it becomes rophobicity, compatibility with polyvinyl-acetal resin worsens, and there is a possibility of causing se separation. A carbon number is a thing of 7-18 more preferably.

71]As sulfonic acid which is 2-21, the above-mentioned carbon number can use the thing of an hatic series system, the thing of an aromatic system, etc. The above-mentioned carbon number is limited especially as sulfonic acid which is 2-21. For example, benzenesulfonic acid, naphthalene onic acid, alkyl sulfonic acid whose carbon numbers of an alkyl group are 2-21. The carbon ber of an alkyl group is alkyl naphthalene sulfonic acid etc. which are 2-11, and the carbon ber of the alkylbenzene sulfonic acid which is 2-15, and an alkyl group specifically, P-

toluenesulfonic acid, dodecylbenzenesulfonic acid, camphor sulfonic acid, hydroxypropanesulfonic acid, mesitylene sulfonic acid, etc. are mentioned. These may be used alone and may use two or more sorts together.

[0072]As for an addition of sulfonic acid whose above-mentioned carbon numbers are 2-21, it is preferred that they are 0.01 - the amount part of duplexs to the polyvinyl-acetal resin 100 above-mentioned weight section. If a preventive effect of a white blush mark according that they are less than 0.01 weight sections to moisture absorption may become insufficient and exceeds the amount part of duplexs, degradation of resin may be promoted or this sulfonic acid itself may cause a white blush mark. It is 0.03 to 1 weight section more preferably.

[0073]In carboxylic acid of 2-20 the above-mentioned carbon number, When hydrophilic nature may become it high that a carbon number is less than two, compatibility with polyvinyl-acetal resin may worsen, distributing may become insufficient and a carbon number exceeds 20, it becomes hydrophobicity, compatibility with polyvinyl-acetal resin worsens, and there is a possibility of causing phase separation. A carbon number is a thing of 6-14 more preferably.

[0074]As carboxylic acid which is 2-20, the above-mentioned carbon number can use a thing of an aliphatic series system, a thing of an aromatic system, etc. It may be dicarboxylic acid. The above-mentioned carbon number is not limited especially as carboxylic acid which is 2-20. For example, acetic acid, propionic acid, butanoic acid, isobutyric acid, 2-ethylbutanoic acid, Octanoic acid, 2-ethylhexyl acid, lauric acid, myristic acid, stearic acid, oxalic acid, malonic acid, succinic acid, adipic acid, pimelic acid, sebacic acid, oleic acid, benzoic acid, toluic acid, naphthoic acid, 1,1-cyclohexane 2 acetic acid, salicylic acid, etc. are mentioned. These may be used alone and may use two or more sorts together.

[0075]As for an addition of carboxylic acid whose above-mentioned carbon numbers are 2-20, it is preferred that it is 0.01 to 3 weight section to the polyvinyl-acetal resin 100 above-mentioned weight section. When a preventive effect of a white blush mark according that they are less than 0.01 weight sections to moisture absorption may become insufficient and exceeds three weight sections, compatibility with resin becomes poor and transperency has a possibility of a problem arising or promoting degradation of resin. It is 0.05 to 1 weight section more preferably.

[0076]In R^3 and R^4 of phosphoric acid which are expressed with the above-mentioned general formula (II), when a carbon number of the above-mentioned aliphatic series system hydrocarbon group or the above-mentioned aromatic system hydrocarbon group exceeds 18, it may become hydrophobicity and compatibility with polyvinyl-acetal resin may worsen. Carbon numbers are 6-12 more preferably.

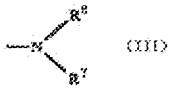
[0077]Especially as phosphoric acid which is the above-mentioned general formula (II) and is expressed, it is not limited, but can use phosphoric acid generally used, and specifically, For example, methylphosphoric acid, ethylphosphoric acid, propylphosphoric acid, isopropylphosphoric acid, Butyl phosphate, laurylphosphate, stearylphosphoric acid, 2-ethylhexyl phosphoric acid, Di(2-ethylhexyl) phosphoric acid, isodecyl phosphoric acid, phenylphosphoric acid, dimethylphosphoric acid, diethylphosphoric acid, diisopropylphosphoric acid, dioctylphosphoric acid, diphenylphosphoric acid, dibenzylphosphoric acid, etc. are mentioned. These may be used alone and may use two or more sorts together.

[0078]As for an addition of phosphoric acid expressed with the above-mentioned general formula (II), it is preferred that they are 0.01 - the amount part of duplexs to the polyvinyl-acetal resin 100 above-mentioned weight section. If a preventive effect of a white blush mark by moisture absorption may become insufficient when it is less than 0.01 weight sections, and the amount part of duplexs is exceeded, degradation of resin may be promoted or this phosphoric acid itself may cause a white blush mark. It is 0.03 to 1 weight section more preferably.

[0079]Organic acid which is compatible in the above-mentioned resin and a plasticizer is used together with amine which is compatible in resin and a plasticizer. What is expressed with following general formula (III) can be conveniently used for amine which is compatible in the above-mentioned resin and a plasticizer.

[0080]

[Formula 3]



(III)

81](R^5, R^6, and R^7 are a hydrogen atom, an aliphatic series system hydrocarbon group whose bon numbers are 1-20, or an aromatic system hydrocarbon group whose carbon numbers are 1-20 ong a formula, respectively.) R^5, R^6, and R^7 may be the same, and may differ from each other.
82]When a carbon number of the above-mentioned aliphatic series system hydrocarbon group or above-mentioned aromatic system hydrocarbon group exceeds 20, it may become hydrophobicity l compatibility with polyvinyl-acetal resin may worsen. As for any one of R^5, R^6, and R^7, it is ferred that it is a long chain, and a hydrocarbon group and R^7 R^5 and whose R^6 are a hydrogen m and the carbon numbers 1-2 are a hydrocarbon group of the carbon numbers 6-16 more ferably.
83]As amine expressed with the above-mentioned general formula (III), For example, they are ntioned by nitrogen-containing heterocyclic compounds, such as aromatic amines, such as 1, 2 l alkylamine of the 3rd class, and aniline, and pyridine, etc., and specifically, Methylamine, ylamine, propylamine, hexylamine, octylamine, Decyl amine, dodecyl amine, tetradecylamine, aniline, oluidine. The 1st class amine, such as naphthylamine; Dimethylamine, diethylamine, Secondary ne, such as dipropyl amine, dihexyl amine, dioctyl amine, and N-methylaniline; Trimethylamine, tiary amine, such as triethylamine, N,N-dimethylhexylamine, N,N-dimethyl octylamine, N,N-ethyldecyl amine, N,N-dimethyldodecyl amine, N,N-dimethylaniline, and pyridine, etc. are ntioned. These may be used alone and may use two or more sorts together.
84]As for an addition of amine expressed with the above-mentioned general formula (III), when a bon number uses sulfonic acid which is 2-21 as organic acid which is compatible in resin and a sticizer, it is preferred that they are 0.01 - the amount part of duplexs to polyvinyl-acetal resin l weight section. When a preventive effect of a white blush mark by moisture absorption may ome insufficient when it is less than 0.01 weight sections, and the amount part of duplexs is eeded, compatibility with resin becomes poor, a problem may arise in transparency or an erlayer may color it it. It is 0.02 to 1 weight section more preferably.
85]As for an addition of amine expressed with general formula (III), when a carbon number uses boxylic acid which is 2-20 as organic acid which is compatible in the above-mentioned resin and a sticizer, it is preferred that it is 0.01 to 3 weight section to polyvinyl-acetal resin 100 weight tion. When a preventive effect of a white blush mark by moisture absorption may become fficient if it is less than 0.01 weight sections and three weight sections are exceeded, patibility with resin becomes poor, a problem may arise in transparency or an interlayer may color . It is 0.05 to 1 weight section more preferably.
86]As for an addition of amine expressed with general formula (III), when using phosphoric acid ressed with the above-mentioned general formula (II) as organic acid which is compatible in the ve-mentioned resin and a plasticizer, it is preferred that they are 0.01 - the amount part of lexs to polyvinyl-acetal resin 100 weight section. When a preventive effect of a white blush mark moisture absorption may become insufficient when it is less than 0.01 weight sections, and the ount part of duplexs is exceeded, compatibility with resin becomes poor, a problem may arise in nsparency or an interlayer may color it it. It is 0.05 to 1 weight section more preferably.
87]As for the above-mentioned organic acid or amine, it is preferred to choose molecular ucture and a molecular weight suitably and to be used according to the degree of acetalization of above-mentioned polyvinyl-acetal resin or a kind of the above-mentioned plasticizer.
88]Amine which is compatible in organic acid, resin, and a plasticizer which are compatible in resin l a plasticizer which are used as the above-mentioned dispersing agent, Respectively it becomes such as sulfonyl ion, a carboxyl ion, phosphoric acid ion, and AMMONIUN ion, it acts on the face of metal salt of particle state which exists in polyvinyl-acetal resin, and combines with a tal ion which constitutes this metal salt, and its counter ion, or [and / that metal salt which these combined by kneading resin at the time of film production is distributed in resin, and metal salt of ticle state becomes small as the result] — or it disappears. For this reason, even if local idensation of water is controlled and polyvinyl-acetal resin absorbs moisture, a white blush mark

of an interlayer for glass laminates obtained can be controlled. Among organic acid which is compatible in resin and a plasticizer which are used as the above-mentioned dispersing agent, especially in phosphoric acid, since a role of a coupling agent of resin and glass is also played, and it has the character in which a film and glass do not exfoliate easily even if it absorbs moisture, exfoliation by moisture absorption of a glass laminate periphery can be controlled.
[0089]As for an interlayer for glass laminates, in this invention, it is preferred to contain at least one sort chosen from a group which consists of alkali metal salt and alkaline earth metal salt as an adhesive strength regulator.
[0090]It is not limited especially as the above-mentioned alkali metal salt and alkaline earth metal salt, for example, salts, such as potassium, sodium, and magnesium, are mentioned. As the above-mentioned salt, inorganic acid, such as organic acid; chlorides, such as carboxylic acid, such as octylic acid, hexylacid, butanoic acid, acetic acid, and formic acid, and nitric acid, is mentioned.
[0091]As the above-mentioned alkali metal salt and alkaline earth metal salt, it is more preferred that they are alkali metal salt of organic acid of the carbon numbers 5-16 and the alkaline earth metal salt of organic acid of the carbon numbers 5-16. It is magnesium salt of carboxylic acid of the carbon numbers 6-10, or dicarboxylic acid preferably.
[0092]It is not limited especially as magnesium salt of the above-mentioned carboxylic acid or dicarboxylic acid, For example, 2-ethylbutanoic acid magnesium, valeric-acid magnesium, hexanoic acid magnesium, magnesium heptanoate, octanoic acid magnesium, magnesium nonanoate, decanoic acid magnesium, glutaric acid magnesium, adipic acid magnesium, etc. are mentioned.
[0093]Magnesium salt of carboxylic acid of the above-mentioned carbon numbers 6-10, or dicarboxylic acid, By existing in a form of a salt, without ionizing in a film, and drawing a water molecule near, it is thought that it is possible to stop adhesive strength between an interlayer and glass, and penetration-proof performance of a glass laminate obtained by this can be made good. Since it is distributed over a membrane surface at high concentration, without condensing in a film and an excessive white blush mark at the time of moisture absorption is not caused while a small quantity shows an adhesive strength adjustment effect, it is desirable.
[0094]As for the above-mentioned alkali metal salt and alkaline earth metal salt, it is preferred that particle diameter is 3 micrometers or less, and they are 1 micrometer or less more preferably. Since it will grow up to be even a size by which a water molecule which gathered around alkali metal salt and/or alkaline earth metal salt is visualized if it exceeds 3 micrometers, a white blush mark may become remarkable and may not be preferred.
[0095]It is not limited especially as a means for the above-mentioned particle diameter to be 3 micrometers or less. For example, even if it is a method of using a compound which is easy to dissolve in polyvinyl-acetal resin or a plasticizer as an adhesive strength regulator, and a compound which is hard to dissolve in polyvinyl-acetal resin or a plasticizer, A method of using what it is hard to condense in polyvinyl-acetal resin and a plasticizer, a method of using together a dispersing agent which distributes them, a compatibilizer, etc., etc. are mentioned.
[0096]As a compound which is easy to dissolve in the above-mentioned combination, polyvinyl butyral resin is used as polyvinyl-acetal resin, for example, In combination using triethylene glycol 2-ethyl butyrate as a plasticizer, organic acid salt, such as octanoic acid magnesium, neo decanoic acid magnesium, and adipic acid magnesium, etc. are mentioned, and these one sort or two sorts or more are used suitably.
[0097]As a potassium compound which is easy to dissolve in the above-mentioned combination, potassium salt of organic acid, such as octanoic acid potassium, neo decanoic acid potassium, and potassium stearate, etc. are mentioned, and these one sort or two sorts or more are used suitably.
[0098]As a sodium compound which is easy to dissolve in the above-mentioned combination, sodium salt of organic acid, such as sodium octanoate, neo decane sodium, and sodium stearate, etc. are mentioned, and these one sort or two sorts or more are used suitably.
[0099]As a compound which is during combination of what it is hard to dissolve in the above-mentioned combination, and is hard to condense, magnesium salt of inorganic acid, such as a magnesium chloride and a magnesium nitrate, etc. are mentioned, and these one sort or two sorts or more are used suitably, for example.
[0100]As a dispersing agent which may be distributed according to concomitant use, or a compatibilizer, a compound which is hard to dissolve in the above-mentioned combination, Although

limited in particular, long chain system organic acid, such as alcohols and octanoic acid, such as anol and octyl alcohol, and nonanoic acid, is mentioned, and these one sort or two sorts or more used suitably, for example.

01]A method of using a compound which itself tends to dissolve in polyvinyl-acetal resin or a sticizer also in various above-mentioned methods is the most preferred, and a method of using a npound which it ranks second and is hard to condense in polyvinyl-acetal resin and a plasticizer is ferred.

02]As the above-mentioned alkali metal salt and alkaline earth metal salt, when using a diester tem compound as a plasticizer, it is preferred that it is what has an acid component and the ucture of a diester system compound. Since it can distribute stably and uniformly and can exist in lm by having a structure similar to an acid component of a diester system compound used as a sticizer, aging is not caused.

03]As the above-mentioned plasticizer, triethylene glycol di-2-ethyl butyrate, When using (it also ng hereafter called "3GH") or a dihexyl horse mackerel peat (henceforth "DHA"), by making metal : of the carbon number 5 or carboxylic acid of 6 contain as an adhesive strength regulator, Since a of adhesive strength of an interlayer and glass with the passage of time can be prevented and vention from a white blush mark and prevention from a fall with the passage of time of adhesive ength can be reconciled, it is desirable. When using triethylene glycol di-2-ethylhexanoate nceforth "3GO") as a plasticizer for same reason, it is preferred that metal salt of carboxylic acid he carbon numbers 6-8 contains. When using tetraethylene Glico Lod'z 2-ethylhexanoate nceforth "4GO") as a plasticizer, it is preferred that metal salt of the carbon number 6 or boxylic acid of 7 contains.

04]In order to prevent hydrolysis by heat at the time of film production of polyvinyl-acetal resin sticized [above-mentioned] as much as possible, It compares with a plasticizer like triethylene col di-heptanoate (3G7) or tetraethylene glycol di-heptanoate (4G7), It is preferred to use a side ain type plasticizer like 3GH which cannot cause hydrolysis easily, 3GO, and 4GO, or a horse ckerel peat system type plasticizer like DHA.

05]Above-mentioned 3GH has a track record long as a plasticizer for interlayers, and has the vantage of being hard to cause hydrolysis, as compared with 3G7 and 4G7 grade which an organic d ingredient of a raw material is a side chain type, and are straight chain types. For example as npared with 3GH, since the above-mentioned 3GO or 4GO are high boiling points, they have the vantage of being hard to vaporize at the time of film production or doubling processing.

06]Above-mentioned 3GH, 3GO, 4GO, and DHA may use together with other plasticizers which y be used alone and mentioned later. Although a concomitant use rate in particular of above-ntioned 3GH, 3GO, 4GO and DHA, and other plasticizers is not limited, it is preferred that the ount of concomitant use of other plasticizers is less than 50% of the weight of a plasticizer of ve-mentioned 3GH, 3GO, 4GO, and DHA. Since the characteristic which above-mentioned 3GH, O, 4GO, and DHA have can weaken with other plasticizers if it is 50 % of the weight or more, an ect of an adhesive strength regulator used corresponding to these may not no longer be nonstrated fully.

07]Metal salt of carboxylic acid as an adhesive strength regulator used when setting a plasticizer he above-mentioned interlayer as a specific thing, Although not limited in particular, pentanoic d metal salt (carbon number 5), hexanoic acid (2-ethylbutanoic acid) metal salt (carbon number 6), ctanoic acid metal salt (carbon number 7), octanoic acid metal salt (carbon number 8), etc. are ntioned, and these one sort or two sorts or more are suitably used according to a kind of the ve-mentioned plasticizer. The above-mentioned carboxylic acid may be a straight chain type, and y be a side chain type.

08]The moisture resistance of an interlayer obtained may become insufficient in case of metal salt ose carbon number of the above-mentioned carboxylic acid is too small, generating of albinism y become large, and a fall preventive effect of adhesive strength of an interlayer and glass with passage of time may become insufficient conversely in case of metal salt whose carbon number carboxylic acid is too large.

09]Metal salt of carboxylic acid as the above-mentioned adhesive strength regulator, Although it y be used independently, respectively, formic acid magnesium, magnesium acetate, A metal salt tem adhesive strength regulator of carboxylic acid of the carbon numbers 1-4 like magnesium

propanoate and magnesium butanoate; it may be used together with other adhesive strength regulators, such as a denaturation silicone oil system adhesive strength regulator mentioned later.

[0110]When adding the above-mentioned alkali metal salt and/or alkaline earth metal salt as an adhesive strength regulator, the addition has 0.01 to 0.2 preferred weight section to polyvinyl-acetal resin 100 weight section. Since an adhesive strength adjustment effect will be lost if it is less than 0.01 weight sections, penetration-proof performance of a glass laminate obtained may fall. If 0.2 weight sections are exceeded, while spoiling the transparency of a glass laminate produced by carrying out bleed out, there is a possibility that adhesive strength of an interlayer and glass may decline too much. It is 0.03 to 0.08 weight section more preferably.

[0111]As for sodium concentration, since especially a white haush mark happens easily when the above-mentioned alkali metal salt is sodium salt, being set to 50 ppm or less is preferred. As for potassium element concentration, since a white blush mark happens easily also when the above-mentioned alkali metal salt is potassium salt, being set to 100 ppm or less is preferred.

[0112]The above-mentioned alkali metal salt and/or alkaline earth metal salt, Sulfuric acid used [others / in a case of adding as the above-mentioned adhesive strength regulator] in a reaction of polyvinyl-acetal resin, The above-mentioned metal salt may have contained in various raw materials, water, etc. which were used in a case where it originates in having used alkali metal salt and alkaline earth metal salt as a neutralizer of an acid catalyst of chloride etc., and a reaction of polyvinyl-acetal resin. Alkali metal salt and alkaline earth metal salt as the above-mentioned neutralizer can be diverted to some other purpose as an adhesive strength regulator.

[0113]An interlayer for glass laminates of this invention consists of a plastic resin film which consists of additive agents, such as an above-mentioned dispersing agent and an adhesive strength regulator, by the above-mentioned polyvinyl-acetal resin, a plasticizer, and necessity.

[0114]As a plasticizer used in this invention, phosphoric acid system plasticizers, such as organic ester system plasticizers, such as a publicly known plasticizer used for this kind of interlayer, for example, monobasic acid ester, and polybasic acid ester, an organic phosphorus acid system, an organic phosphorous acid system, etc. are used.

[0115]In the above-mentioned monobasic acid ester, for example Triethylene glycol, Glycol system ester obtained by a reaction with organic acid, such as butanoic acid, isobutyric acid, caproic acid, 2-ethylbutanoic acid, heptanoic acid, n-octylic acid, 2-ethylhexyl acid, pelargonic acid (n-nonylic acid), and decylacid, is preferred. In addition, ester of tetraethylene glycol, tripropylene glycol, and the above-mentioned organic acid is also used.

[0116]As the above-mentioned polybasic acid ester, ester of organic acid, such as adipic acid, sebacic acid, and azelaic acid, and straight chain shape of the carbon numbers 4-8 or branched state alcohol is preferred, for example.

[0117]As an example of the above-mentioned organic ester system plasticizer, Triethylene glycol di-2-ethyl butyrate, triethylene glycol di-2-ethylhexoate, Triethylene glycol dicaprylate, triethylene glycol di-n-octoate, Triethylene glycol di-n-HEPUTOETO, tetraethylene glycol di-n-HEPUTOETO, other dibutyl sebacate, dioctylazelate, and a dibutylcarbitol horse mackerel peat are used suitably.

[0118]In addition, ethylene glycol di-2-ethyl butyrate, 1,3-propylene glycol di-2-ethyl butyrate, 1,4-propylene glycol di-2-ethyl butyrate, 1,4-butylene GURIKORUJI 2-ethyl butyrate, 1,2-butylene-glycol di-2-ethylene butyrate, diethylene-glycol di-2-ethyl butyrate, Diethylene-glycol di-2-ethylhexoate, dipropylene glycol di-2-ethyl butyrate, Triethylene glycol di-2-ECHIRUPENTOETO, tetraethylene glycol di-2-ethyl butyrate, diethylene-glycol JIKAPURIETO, etc. are used as a plasticizer.

[0119]As the above-mentioned phosphoric acid system plasticizer, tributoxyethyl phosphate, isodecyl phenyl phosphate, triisopropyl phosphite, etc. are preferred. It is preferred to blend a diester system compound which consists of dicarboxylic acid and monohydric alcohol, or consists of monocarboxylic acid and dihydric alcohol in the above-mentioned plasticizer.

[0120]As the above-mentioned amount of plasticizers, 20 to 70 weight section is preferred to polyvinyl-acetal resin 100 weight section, and it is 40 to 60 weight section more preferably. The penetration resistance of a glass laminate which will be obtained if it is less than 20 weight sections may fall, if 70 weight sections are exceeded, a plasticizer will carry out bleeding, optical strain may become large or the transparency of a resin layer and an adhesive property may fall.

[0121]In this invention, a publicly known additive agent currently used for interlayers for glass laminates, such as conversion silicone oil for controlling penetration resistance besides a dispersing

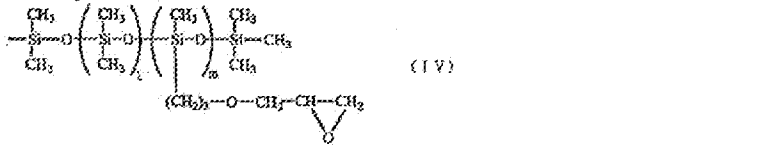
nt and an adhesive strength regulator, an ultraviolet ray absorbent, light stabilizer, an antioxidant, urface-active agent, and colorant, as an additive agent can be blended.

22]An epoxy denaturation silicone oil which is not limited especially as the above-mentioned dified silicone oil, for example, is indicated by JP,55-29950,B. Ether denaturation silicone oil, ester aturation silicone oil, and amine denaturation silicone oil carboxyl modified silicone oil etc. are ntioned. These modified silicone oil is fluids produced by making a compound which should aturalize to a polysiloxane react generally.

23]In this invention, it is following general formula (IV).

24]

ormula 4]

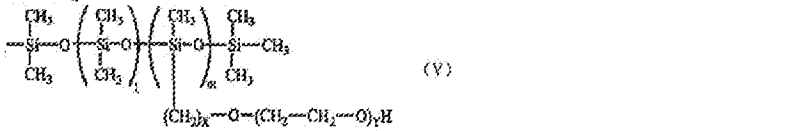


(IV)

25]Epoxy modified silicone oil, following general formula (V) which are expressed with (l and m ress 30 or less positive integer among a formula)

26]

rmula 5]

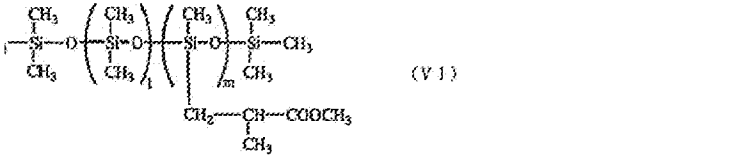


(V)

27]Ether modified silicone oil expressed with (x and y to which l and m express 30 or less positive ger express 20 or less positive integer among a formula), and following general formula (VI)

28]

rmula 6]



(VI)

29]Ester modified silicone oil expressed with (l and m express 30 or less positive integer among a mula) is used especially preferably. Although each modified silicone oil shown by the above- ntioned general formula (IV), (V), and (VI) is expressed with a structural formula of a block olymer, in this invention, what is expressed with a structural formula of a random copolymer is d similarly.

30]The above-mentioned modified silicone oil may be used alone, and may use two or more sorts ether. As for a molecular weight of the above-mentioned modified silicone oil, 800-5000 are ferred. If localization to the surface falls that it is less than 800 and 5000 is exceeded, npatibility with resin becomes poor, bleed out will be carried out to a membrane surface, and esive strength with glass will fall to it. It is 1500-4000 more preferably.

31]An addition of the above-mentioned modified silicone oil has 0.01 to 0.2 preferred weight tion to the polyvinyl-acetal resin 100 above-mentioned weight section. If a preventive effect of a te blush mark according that they are less than 0.01 weight sections to moisture absorption omes insufficient and exceeds 0.2 weight section, compatibility with resin becomes poor, bleed will be carried out to a membrane surface, and adhesive strength with glass will fall to it. It is 0.03 0.1 weight section more preferably.

32]It is not limited especially as the above-mentioned antioxidant, but as a thing of a phenol

system. For example, t-butylhydroxytoluene (BHT) ("Sumi Rider BHT (trade name)" by Sumitomo Chemical Co., Ltd.), Tetrakis [methylene-3-(3'-5'-di-t-butyl-4'-hydroxyphenyl) propionate] methane (IRUGA NOx 1010, Ciba-Geigy make) etc. are mentioned.

[0133]It is not limited especially as the above-mentioned ultraviolet ray absorbent, but as a thing of a benzotriazol system, for example, 2-(2'-hydroxy-5'-methylphenyl) benzotriazol (the tinuvin P.) The Ciba-Geigy make, 2-(2'-hydroxy-3' and 5'-di-t-buthylphenyl) benzotriazol (the tinuvin 320, Ciba-Geigy make), A 2-(2'-hydroxy-3'-t-butyl-5'-methylphenyl)-5-chlorobenzotriazole (the tinuvin 326, Ciba-Geigy make), A thing of hindered amine systems, such as thing;LA-57 (made by ADEKAAGASU) of benzotriazol systems, such as 2-(2'-hydroxy-3' and 5'-di-amyl phenyl) benzotriazol (the tinuvin 328, Ciba-Geigy make), etc. are mentioned.

[0134]As the above-mentioned light stabilizer, a thing of a hindered amine system, for example, "ADEKA stub LA-57" by the Asahi electrification company etc., (trade name) is mentioned. As the above-mentioned surface-active agent, sodium lauryl sulfate, alkylbenzene sulfonic acid, etc. are mentioned, for example.

[0135]A manufacturing method of an interlayer for glass laminates of this invention. Although not limited in particular, other additive agents are blended with each above-mentioned resin [a plasticizer and if needed] for the specified quantity, A film is produced to a sheet shaped with an extrusion method, the calendar method, the pressing method, casting method, a tubular film process, etc., and a resin layer is fabricated, and let this be an interlayer, after kneading this uniformly.

[0136]thickness of the whole interlayer for glass laminates of this invention --- as a glass laminate --- the minimum --- when required penetration resistance and weatherability are taken into consideration, generally the range of 0.3-1.6 mm is preferred like thickness in the usual interlayer for glass laminates practical.

[0137]As a glass plate used for the above-mentioned glass laminate, not only an inorganic clear glass board but organic clear glass boards, such as a polycarbonate board and a polymethylmethacrylate board, can be used.

[0138]Especially as a kind of the above-mentioned inorganic clear glass board, it is not what is limited, Various inorganic glass, such as float sheet glass, polished plate glass, figured glass, wire glass, sheet glass containing a line, heat ray absorption plate glass, and colored sheet glass, etc. may be mentioned, these may be used independently, and two or more sorts may be used together. An inorganic clear glass board and an organic clear glass board may be laminated. Thickness of glass should just be suitably chosen by use and is not restricted in particular by it.

[0139]In order to manufacture a glass laminate of this invention, a process of the usual glass laminate is adopted. For example, between transparent glass plates of two sheets, pinch an interlayer which consists of a resin layer fabricated by an above-mentioned method, and putting this into a rubber bag and carrying out decompression sucking, at about 70-110 **, carry out preliminary adhesion and it ranks second, It is manufactured by performing this adhesion by a pressure of about ten to 15 kg/cm^2 at about 120-150 ** using a press, using autoclave.

[0140]In a manufacturing method of a glass laminate, heat crimping may be carried out at temperature of 60-100 ** at the same time it makes the above-mentioned interlayer which comes at least to produce a film polyvinyl butyral resin plasticized between glass plates of a couple intervene and carries out suction deaeration under decompression. Put a layered product of a glass plate / interlayer / glass plate into a rubber bag, and more specifically for example, in autoclave, -For [10 to 30 minutes] grade heat crimping is carried out by a pressure about temperature of about 60-100 **, and 1 - 10 kg/cm^2, carrying out suction deaeration under decompression of an about [500--700mmHg], and it carries out by performing deaeration and adhesion simultaneously.

[0141]By limiting temperature when carrying out heat crimping to the range of 60-100 ** as mentioned above in this manufacturing method, and setting up suitably terms and conditions, such as a sticking-by-pressure pressure, sticking-by-pressure time, and a decompression degree when carrying out suction deaeration, by within the limits about the above, It can adjust so that it may fall within the fitness range of a request of adhesive strength of an interlayer and glass.

[0142]

[Example]Although an example is hung up over below and this invention is explained to it in more detail, this invention is not limited only to these examples. The "part" in an example means a "weight section."

43]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of onification of 98.9 mol to the preparation pure water 2890g of Example 1 (1) resin --- warming --- issolved. Temperature control of the system of reaction was carried out to 12 **, 35% of chloride alysts [201 g of] and the n-butylaldehyde 148g were added, this temperature was held, and the ctant was deposited. Then, hold the system of reaction at 45 ** for 3 hours, make a reaction nplete, superfluous water washes, and unreacted n-butylaldehyde is flushed. The sodium hydroxide ution which is a general-purpose neutralizer neutralized the chloride catalyst, and also white dered polyvinyl butyral resin was obtained through rinsing and desiccation for 2 hours with erfluous water. The vinyl-acetal ingredient (degree of acetalization) of this resin was 65.0-mol %, l the vinyl acetate component was 1.1-mol %.

44](2) Manufacture above-mentioned polyvinyl-butyral-resin 100 weight section of an interlayer, er mixing triethylene-glycol-di-2-ethyl-butyrate 40 weight section as a plasticizer and fully rying out melt kneading of this with a roll mill, with the press-forming machine, press forming was ried out for 30 minutes, and 150 ** of 0.76-mm-thick interlayers were obtained. The result of ing measured the particle diameter of the sodium salt in an interlayer, and potassium salt by ging of the secondary ion image using a time-of-flight type secondary-ion-mass-spectroscopy)F-SIMS) device (product [made by PHIEVANS] TFS-2000 type). The particle diameter of 1 rometer and potassium salt of the particle diameter of the sodium salt in an interlayer was less n 0.5 micrometer. The bottom was a result and 6 ppm in fixed quantity in ICP luminescence mate analysis about the sodium element content of this interlayer. After ICP luminescence mate analysis heats and decomposes a sample with sulfuric acid and nitric acid and sets the ume of this decomposition product with ultrapure water, it is the method of quantifying by the -AES method using an ICP-AES device (the "ICAP-575 type" by a Japanese jar rel ash npany).

45](3) It inserts from both sides using the manufacture above-mentioned interlayer of a glass inate with a transparent float glass (30 cm by 30 cmx2.5 mm in thickness). After putting this in in rubber bag and carrying out indirect desulfurization mind with the degree of vacuum of 20torr for minutes, it moved to 90 ** oven, deaerated, and the vacuum press was carried out, holding for 30 utes at 80 more **. Thus, this adhesion was performed for the glass laminate by which preliminary esion was carried out for 20 minutes on pressure 12 kg/cm^2 and conditions with a temperature of ** in air type autoclave, and the transparent glass laminate was obtained. About the obtained ss laminate, an adhesive examination (pan Meru examination) and the moisture-proof white-blush-k sex test were done by the following methods.

46]A quality assessment (1) adhesive-property (pan Meru) examination glass laminate is neglected l adjusted to -18 ****0.6 ** temperature, and this is struck with the hammer whose weight of a d is 0.45 kg, and it grinds until the particle diameter of glass is set to 6 mm or less. And the ree of exposure of the film after glass carries out partial avulsion is judged with the boundary ple which carried out grade attachment beforehand, as shown in Table 1. This is for the adhesive ength of a glass plate and an interlayer to judge whether it is in the predetermined range.

47]

ble 1]

剥離の接触度（%）	パンメル値
100	0
99	1
85	2
80	3
40	4
20	5
10	6
5	7
2以下	8

[0148](2) The moisture-proof white-blush-mark sex-test resin layer was cut into the size of 4x4 cm. it was immersed in the ion exchange water of ordinary temperature (23 **), and Hayes of 24 hours after was measured using the integral equation turbidity meter (made by Tokyo Denshoku Co., Ltd.). The result was shown in Table 2.

[0149]In preparation of resin of example 2 Example 1, washing and a washing process after putting in a neutralizer were changed in 1.5 hours, and it carried out like Example 1 except it. In this case, as for the sodium element content in the obtained interlayer, the particle diameter of 3 micrometers and potassium salt of the particle diameter of 13 ppm and sodium salt was less than 0.5 micrometer.

[0150]In preparation of resin of example 3 Example 1, it carried out like Example 1 except having changed washing and a washing process after putting in a neutralizer in 2.5 hours. In this case, as for the sodium element content in the obtained interlayer, the particle diameter of 0.5 micrometer and potassium salt of the particle diameter of 3 ppm and sodium salt was less than 0.5 micrometer.

[0151]In preparation of resin of example 4 Example 1, it carried out like Example 1 except having changed washing and a washing process after putting in a neutralizer in 3.5 hours. In this case, as for the sodium element content in the obtained interlayer, the particle diameter of less than 0.5 and potassium salt of the particle diameter of 0.9 ppm and sodium salt was less than 0.5 micrometer.

[0152]In preparation of resin of comparative example 1 Example 1, it carried out like Example 1 except having changed washing and a washing process after putting in a neutralizer in 1 hour. In this case, the particle diameter of 17 ppm and sodium salt of the sodium element content in the obtained interlayer was 6 micrometers.

[0153]In preparation of resin of comparative example 2 Example 1, it carried out like Example 1 except having changed washing and a washing process after putting in a neutralizer in 0.5 hour. The particle diameter of 35 ppm and sodium salt of the sodium element content in the obtained interlayer was 13 micrometers. The evaluation result of the above Examples 1-4 and the comparative examples 1 and 2 was shown in Table 2.

[0154]

[Table 2]

		実施例				比較例	
		1	2	3	4	1	2
中間膜	アセタール基残基数	4	4	4	4	4	4
	アセタール化度(mol%)	65.0	65.0	65.0	65.0	65.0	65.0
	平均重合度	1700	1700	1700	1700	1700	1700
	ビニルアセテート成分（mol%）	1.1	1.1	1.1	1.1	1.1	1.1
	可塑剤濃度（重量部）	40	40	40	40	40	40
	ナトリウム濃度(ppm)	6	13	3	0.9	17	35
	ナトリウム粒径（μm）	1	3	0.5	0.5>	6	13
	カリウム濃度(ppm)	0.5	0.5	0.5	0.5	--	--
	カリウム粒径（μm）	0.5>	0.5>	0.5>	0.5>	--	--
合わせガラスの接着性（パンメル値）		8	8	8	8	8	8
水浸後2.4時間後のヘイズ（%）		28	27	24	18	67	62
総合判定		○	○	○	○	×	×

[0155]The moisture resistance excellent in Examples 1-4 is shown so that clearly from the above-mentioned result.

[0156]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of saponification of 98.9 mol to the preparation pure water 2890g of Example 5 (1) resin --- warming --- it dissolved. Temperature control of the system of reaction was carried out to 12 **, 35% of chloride catalysts [201 g of] and the n-butylaldehyde 148g were added, this temperature was held, and the reactant was deposited. Then, hold the system of reaction at 45 ** for 3 hours, make a reaction

nplete, the water of an excess (it is 30 times the amount to resin) washes, and unreacted n-
ylaldehyde is flushed, The potassium hydroxide solution which is a general-purpose neutralizer
tralized the chloride catalyst, and also white powdered polyvinyl butyral resin was obtained
ough rinsing and desiccation for 2 hours with superfluous water. The vinyl-acetal ingredient
gree of acetalization) of this resin was 65.0-mol %, and the vinyl acetate component was 1.1-mol

57](2) Manufacture above-mentioned polyvinyl-butyral-resin 100 weight section of an interlayer,
er mixing triethylene-glycol-di-2-ethyl-butyrate 40 weight section as a plasticizer and fully
rying out melt kneading of this with a roll mill, with the press-forming machine, press forming was
ried out for 30 minutes, and 150 ** of 0.76-mm-thick interlayers were obtained. The bottom was a
ult and 23 ppm in fixed quantity in ICP luminescence ultimate analysis about the potassium
mental content of this interlayer. The particle diameter of less than [0.5 micrometer] mum and
assium salt of the particle diameter of the sodium salt in an interlayer was less than 3
rometers.
58](3) It inserts from both sides using the manufacture above-mentioned interlayer of a glass
inate with a transparent float glass (30 cm by 30 cmx2.5 mm in thickness), After putting this in in
rubber bag and carrying out indirect desulfurization mind with the degree of vacuum of 20torr for
minutes, it moved to 90 ** oven, deaerated, and the vacuum press was carried out, holding for 30
utes at 80 more **. Thus, this adhesion was performed for the glass laminate by which preliminary
esion was carried out for 20 minutes on pressure 12 kg/cm^2 and conditions with a temperature of
** in air type autoclave, and the transparent glass laminate was obtained.
59]In preparation of resin of example 6 Example 5, it carried out like Example 5 except having
nged washing and a washing process after putting in a neutralizer in 2.5 hours. In this case, as for
potassium elemental content in the obtained interlayer, the particle diameter of 1 micrometer and
ium salt of the particle diameter of 5 ppm and potassium salt was less than 0.5 micrometer.
60]In preparation of resin of example 7 Example 5, it carried out like Example 5 except having
nged washing and a washing process after putting in a neutralizer in 3.5 hours. In this case, as for
potassium elemental content in the obtained interlayer, the particle diameter of less than 0.5
rometer and sodium salt of the particle diameter of 0.7 ppm and potassium salt was less than 0.5
rometer.
61]In preparation of resin of comparative example 3 Example 5, it carried out like Example 5
ept having changed washing and a washing process after putting in a neutralizer in 1 hour. In this
e, the particle diameter of 104 ppm and potassium salt of the potassium elemental content in the
ained interlayer was 6 micrometers.
62]In preparation of resin of comparative example 4 Example 5, it carried out like Example 5
ept having changed washing and a washing process after putting in a neutralizer in 0.5 hour. In this
e, the particle diameter of 220 ppm and potassium salt of the potassium elemental content in the
ained interlayer was 9 micrometers.
63]About the glass laminate obtained by the above Examples 5-8 and comparative examples 3 and
n adhesive examination (pan Meru examination) and a humidity test are done by the same method
the above-mentioned, and the evaluation result is summarized in Table 3, and is shown.
64]
ble 3]

		実施例			比較例	
		5	6	7	8	4
中間膜	アセタール基炭素数	4	4	4	4	4
	アセタール化度(mol%)	65.0	65.0	65.0	65.0	65.0
	平均重合度	1700	1700	1700	1705	1700
	ビニルアセテート成分(mol%)	1.1	1.1	1.1	1.1	1.1
	可塑剤量（炭素数）	40	40	40	40	40
	カリウム濃度(ppm)	23	5	0.7	104	220
	カリウム粒径（μm）	3	1	0.5>	6	9
	ナトリウム濃度(ppm)	8.7	8.6	8.6	--	--
	ナトリウム粒径（μm）	0.5>	0.5>	0.5>	--	--
合わせガラスの接着性（パンメル値）		8	8	8	8	7
水浸漬２４時間後のヘイズ（%）		24	20	14	60	92
総合判定		○	○	○	×	×

[0165]The moisture resistance excellent in Examples 5-7 is shown so that clearly from the above-mentioned result.
[0166]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of saponification of 98.9 mol to the preparation pure water 2890g of Example 8 (1) resin -- warming -- it dissolved. Temperature control of the system of reaction was carried out to 12 **, 35% of chloride catalysts [201 g of] and the n-butylaldehyde 148g were added, this temperature was held, and the reactant was deposited. Then, hold the system of reaction at 45 ** for 3 hours, make a reaction complete, superfluous water washes, and unreacted n-butylaldehyde is flushed, The sodium hydroxide solution which is a general-purpose neutralizer neutralized the chloride catalyst, and also white powdered polyvinyl butyral resin was obtained through rinsing and desiccation with superfluous water. The degree of acetalization of this resin was 65.0-mol %.
[0167](2) Triethylene-glycol-di-2-ethyl-butyrate 40 weight section was mixed with manufacture above-mentioned polyvinyl-butyral-resin 100 weight section of the interlayer as a plasticizer, press forming was carried out with the press-forming machine, and the interlayer was obtained. The bottom was a result and 13 ppm in fixed quantity in the ICP luminescence elemental analysis device about the sodium element content of this interlayer. The particle diameter of the sodium salt in an interlayer was 3 micrometers.
[0168](3), pinching the manufacture above-mentioned interlayer of a glass laminate between the 2.5-mm-thick float glasses of two sheets, putting this in in a rubber bag, and carrying out suction deaeration under decompression of -600mmHg in autoclave. Heat crimping was simultaneously performed for 20 minutes on condition of the temperature of 60 **, and pressure ^{2} of 5kg/cm, and the glass laminate was produced.
[0169]In production of the glass laminate of example 9 Example 8, the glass laminate was produced like Example 8 except the temperature at the time of heat crimping having been 80 **. The particle diameter of the sodium salt in an interlayer was 3 micrometers.
[0170]In production of the glass laminate of example 10 Example 8, the glass laminate was produced like Example 8 except the temperature at the time of heat crimping having been 100 **. The particle diameter of the sodium salt in an interlayer was 3 micrometers.
[0171]In preparation of resin of comparative example 5 Example 8, except having changed washing and a washing process for a short time a little, it carried out like Example 8 and the glass laminate was produced. In this case, the particle diameter of 30 ppm and sodium salt of the sodium element content in the obtained interlayer was 11 micrometers.

72]About the glass laminate obtained by the above Examples 8-10 and comparative example 5, adhesive examination (pan Meru examination) and the heat resistance test were done by the owing methods. About the humidity test, it carried out like Example 1.
73]After cooling a valuation method (1) adhesive-property (pan Meru) examination glass laminate -20 ** for 2 hours, An automatic hammer ring device is equipped, the whole surface of a glass inate is uniformly hit by a hammer head, the area of the glass piece adhering to the interlayer of a ss laminate is observed visually, and adhesive strength (pan Meru value) is judged as contrasted n the grade sample shown in Table 1. The adhesive strength minimum is one point and the ximum of a grade sample is a ten-point method of ten points. Curved-surface shaping of the tom is carried out with the curvature which is 50 mm in radius, the used automatic hammer ring vice has a hammer head with a blow effective diameter of 5 mm and a weight of 240g, and the king power of a hammer head can be adjusted with a spring screw.
74][(2) Take out and observe the existence of foaming visually, after neglecting the obtained glass inate under 130 ** atmosphere for 2 hours based on the heat resistance test JIS R3205 "glass inate." The result of the above Examples 8-10 and the comparative example 5 was summerized in le 4, and was shown.
75]
ble 4]

	実施例			比較例
	8	9	10	5
ナトリウム濃度(ppm)	13	13	13	36
ナトリウム粒径（μm）	3	3	3	11
わせガラスの接着性（パンメル値）	5	5	8	5
浸漬２４時間後のヘイズ（%）	37	38	33	66
わせガラスの耐熱性試験後の発泡の有無	なし	なし	なし	なし
合判定	○	○	○	×

76]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of onification of 98.9 mol to the preparation pure water 2890g of Example 11 (1) resin --- warming --- issolved. Temperature control of the system of reaction was carried out to 12 **, 35% of chloride alysts [201 g of] and the n-butylaldehyde 148g were added, this temperature was held, and the ctant was deposited. Then, held the system of reaction at 45 ** for 3 hours, the reaction was de to complete, the water of the excess (they are 30 times to resin) washed, and unreacted n-ylaldehyde was flushed. The pH value was 5.1 when pH of the system at this time was measured. ried with the centering dehydrator and resin of water content was obtained 50%. White powdered yvinyl butyral resin was obtained for this resin through the desiccation under the atmosphere of 60 and -700mmHg. The degree of acetalization of this resin was 65.0-mol %.
77][(2) Triethylene-glycol-di-2-ethyl-butyrate 40 weight section was mixed with manufacture ve-mentioned polyvinyl-butyral-resin 100 weight section of the interlayer as a plasticizer, press ming was carried out with the press-forming machine, and the interlayer was obtained. The bottom s a result and 0.7 ppm in fixed quantity in the ICP luminescence elemental analysis device about sodium element content in this interlayer. The particle diameter of the sodium salt in an interlayer s less than 0.5 micrometer.
78][(3), pinching the manufacture above-mentioned interlayer of a glass laminate between the 2.5-m-thick float glasses of two sheets, putting this in in a rubber bag, and carrying out suction eration under decompression of -600mmHg in autoclave. Heat crimping was simultaneously formed for 20 minutes on condition of the temperature of 60 **, and pressure ^{2} of 5kg/cm, and glass laminate was produced
79]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of

saponification of 98.9 mol to the preparation pure water 2890g of Example 12 (1) resin --- warming --- it dissolved. Temperature control of the system of reaction was carried out to 12 **, 35% of chloride catalysts [201 g of] and the n-butylaldehyde 148g were added, this temperature was held, and the reactant was deposited. Then, hold the system of reaction at 45 ** for 3 hours, and the reaction was made to complete, the water of the excess (they are 30 times to resin) washed, unreacted n-butylaldehyde was flushed, and the chloride catalyst was neutralized using the sodium hydroxide solution which is a general-purpose neutralizer. Then, it rinsed with water with a temperature of 50 ** of an excess (they are 30 times to resin), and white powdered polyvinyl butyral resin was obtained through desiccation. The degree of acetalization of this resin was 65.0-mol %.
[0180][(2) Triethylene-glycol-di-2-ethyl-butyrate 40 weight section was mixed with manufacture above-mentioned polyvinyl-butyral-resin 100 weight section of the interlayer as a plasticizer, press forming was carried out with the press-forming machine, and the interlayer was obtained. The bottom was a result and 10 ppm in fixed quantity in the ICP luminescence elemental analysis device about the sodium element content in this interlayer. The particle diameter of the sodium salt in an interlayer was 3 micrometers.
[0181][(3), pinching the manufacture above-mentioned interlayer of a glass laminate between the 2.5-mm-thick float glasses of two sheets, putting this in in a rubber bag, and carrying out suction deaeration under decompression of -600mmHg in autoclave. Heat crimping was simultaneously performed for 20 minutes on condition of the temperature of 60 **, and pressure 5 kg/cm^{2}, and the glass laminate was produced.
[0182]In example 13 Example 12, the interlayer was obtained like Example 12 except [all] having used water with a temperature of 60 ** by washing after neutralization. The degree of acetalization of this interlayer was 65.0-mol %. The bottom was a result and 15 ppm in fixed quantity in the ICP luminescence elemental analysis device about the sodium element content in this interlayer. The particle diameter of the sodium salt in an interlayer was 4 micrometers.
[0183]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of saponification of 98.9 mol to the preparation pure water 2890g of Example 14 (1) resin --- warming --- it dissolved. Temperature control of the system of reaction was carried out to 12 **, 35% of chloride catalysts [201 g of] and the n-butylaldehyde 148g were added, this temperature was held, and the reactant was deposited. Then, hold the system of reaction at 45 ** for 3 hours, make a reaction complete, superfluous water washes, and unreacted n-butylaldehyde is flushed. Magnesium hydroxide which is a general-purpose neutralizer neutralized the chloride catalyst, and also it rinsed with superfluous water, and white powdered polyvinyl butyral resin was obtained through desiccation.
[0184][(2) Triethylene-glycol-di-2-ethyl-butyrate 40 weight section was mixed with manufacture above-mentioned polyvinyl-butyral-resin 100 weight section of the interlayer as a plasticizer, press forming was carried out with the press-forming machine, and the interlayer was obtained. The bottom was a result and 0.7 ppm in fixed quantity in the ICP luminescence elemental analysis device about the sodium element content in this interlayer. The particle diameter of the sodium salt in an interlayer was less than 0.5 micrometer.
[0185][(3), pinching the manufacture above-mentioned interlayer of a glass laminate between the 2.5-mm-thick float glasses of two sheets, putting this in in a rubber bag, and carrying out suction deaeration under decompression of -600mmHg in autoclave. Heat crimping was simultaneously performed for 20 minutes on condition of the temperature of 60 **, and pressure ^{2} of 5kg/cm, and the glass laminate was produced.
[0186]About the glass laminate obtained in above Examples 11-14, the heat resistance test was done by the following methods. About the humidity test, it carried out like Example 1. However, Example 14 carried out only the humidity test.
[0187]The resin 1g was put into the valuation method (1) heat resistance test usual test tube, it heated in a 150 ** oil bath for 60 minutes, and the existence of degradation of resin was observed. The result of the above Examples 11-14 was summarized in Table 5, and was shown.
[0188]
[Table 5]

	実施例			
	11	12	13	14
ナトリウム濃度(ppm)	0.7	10	15	0.7
ナトリウム粒径 (μm)	0.5>	3	4	0.5>
耐熱性試験	問題なし	問題なし	問題なし	−
浸漬24時間後のヘイズ (%)	13	32	39	24
合否判定	○	○	○	−

89]adding the polyvinyl alcohol 275g of the average degree of polymerization 1700 and 0.1 % of the ight of the degree % and sodium acetate content of saponification of 98.9 mol to the preparation e water 2890g of Example 15 (1) resin --- warming --- it dissolved. Temperature control of the tem of reaction was carried out to 12 **, 35% of chloride catalysts [201 g of] and the n-ylaldehyde 148g were added, this temperature was held, and the reactant was deposited. Then, d the system of reaction at 45 ** for 3 hours, make a reaction complete, superfluous water (they 30 times to resin) washes, and unreacted n-butylaldehyde is flushed, After neutralizing a chloride alyst using sodium hydroxide which is a general-purpose neutralizer, superfluous water washed l white powdered polyvinyl butyral resin was obtained through desiccation. The degree of talization of this resin was 65-mol %.

90](2) Triethylene-glycol-di-2-ethyl-butyrate 40 weight section was mixed with manufacture ve-mentioned polyvinyl-butyral-resin 100 weight section of the interlayer as a plasticizer, press ming was carried out with the press-forming machine, and the interlayer was obtained. The bottom s a result and 8 ppm in fixed quantity in the ICP luminescence elemental analysis device about the lium element content in this interlayer.

91]The interlayer was obtained like Example 15 except having used the polyvinyl alcohol 275g of example 16 average degree of polymerization 1700 and 0.4 % of the weight of the degree % and lium acetate content of saponification of 98.9 mol. The degree of acetalization of this interlayer s 65.0-mol %. The bottom was a result and 13 ppm in fixed quantity in the ICP luminescence mental analysis device about the sodium element content in this interlayer.

92]adding the polyvinyl alcohol 275g of the average degree of polymerization 1700 and 0.1 % of the ight of the degree % and sodium acetate content of saponification of 98.9 mol to the preparation e water 2890g of Example 17 (1) resin --- warming --- it dissolved. Temperature control of the tem of reaction was carried out to 12 **, 35% of chloride catalysts [201 g of] and the n-ylaldehyde 148g were added, this temperature was held, and the reactant was deposited. Then, d the system of reaction at 45 ** for 3 hours, make a reaction complete, superfluous water (they 30 times to resin) washes, and unreacted n-butylaldehyde is flushed, After neutralizing a chloride alyst using octanoic acid magnesium which is a neutralizer, superfluous water washed and white vdered polyvinyl butyral resin was obtained through desiccation. The degree of acetalization of this in was 65-mol %.

93](2) Triethylene-glycol-di-2-ethyl-butyrate 40 weight section was mixed with manufacture ve-mentioned polyvinyl-butyral-resin 100 weight section of the interlayer as a plasticizer, press ming was carried out with the press-forming machine, and the interlayer was obtained. The bottom s a result and 2 ppm in fixed quantity in the ICP luminescence elemental analysis device about the lium element content in this interlayer.

94]The interlayer was obtained like Example 17 except having used ethyleneoxide as a neutralizer n example 18 chloride catalyst. The degree of acetalization of this interlayer was 65-mol %. The tom was a result and 2 ppm in fixed quantity in the ICP luminescence elemental analysis device ut the sodium element content in this interlayer. Using the interlayer obtained in above-mentioned mples 15-18, the same heat resistance test as Example 11 and the same humidity test as mple 1 were done, and the result was shown in Table 6.

95]

ble 6]

	実施例			
	15	16	17	18
ポリビニルアルコールの酢酸ナトリウム含有量 (重量%)	0.1	0.4	0.1	0.1
ナトリウム濃度(ppm)	8	13	2	2
ナトリウム粒径 (μm)	0.8	2	0.5>	0.5>
耐熱性試験	問題なし	問題なし	問題なし	問題なし
水浸漬24時間後のヘイズ (%)	18	35	11	10
総合判定	○	○	○	○

[0196]adding the average degree of polymerization 1700, and the saponification degree% of polyvinyl alcohol 275g of 98.9 mol to the preparation pure water 2890g of example 19(1) polyvinyl-acetal resin --- warming --- it dissolved. Temperature control of the system of reaction was carried out to 12 **, 35% of the weight of chloride catalysts [201 g of] and the n-butylaldehyde 148g were added, this temperature was held, and the reactant was deposited. Then, hold the system of reaction at 45 ** for 3 hours, make a reaction complete, superfluous water washes, and unreacted n-butylaldehyde is flushed, The sodium hydroxide solution which is a general-purpose neutralizer neutralized the chloride catalyst, and white powdered polyvinyl butyral resin was obtained through rinsing and desiccation for 2 hours with still more superfluous water. The amount of 64-mol % and survival acetyl groups of the degree of formation of average butyral of this resin was 1-mol %.

[0197](2) the polyvinyl butyral resin (average-degree-of-polymerization 1700 and degree % of 64 mol of formation of average butyral.) obtained by the manufacture above of the interlayer for glass laminates 0.08 copy of octanoic acid magnesium is added as a plasticizer to amount of residual acetyl groups 1 mol %100 copy as 40 copies of triethylene glycol di-2-ethyl butyrate, and an adhesive regulator, After fully carrying out melt kneading with a roll mill, press forming was carried out for 30 minutes at 150 ** using the press-forming machine, and the interlayer for glass laminates of 0.76 mm of average thickness was obtained. The particle diameter of 10 ppm and sodium salt of the sodium content in the obtained interlayer for glass laminates was 1 micrometer. It was 0.9 micrometer when the particle diameter of the magnesium salt which exists in an interlayer was measured using the time-of-flight type secondary-ion-mass-spectroscopy device (TOF-SIMS).

[0198](3) The interlayer for glass laminates obtained by the manufacture above of the glass laminate, After having put from the both sides with the transparent float glass (30 cm by 30 cmx3 mm in thickness), putting this in in the rubber bag and carrying out indirect desulfurization mind with the degree of vacuum of 20torr for 20 minutes, it moved to oven, deaerated, and the vacuum press was carried out, holding for 30 minutes at 90 more **. Thus, this sticking by pressure was performed for the glass laminate by which preparative pressure arrival was carried out for 20 minutes on condition of the temperature of 135 **, and pressure 12 kg/cm^2 in air type autoclave, and the glass laminate was obtained.

[0199]In manufacture of the interlayer for example 20 glass laminates, the interlayer for glass laminates and the glass laminate were obtained like Example 19 instead of 0.08 copy of octanoic acid magnesium as an adhesive regulator except having added 0.09 copy of neo decanoic acid magnesium. It was 0.5 micrometer when the particle diameter of the magnesium salt which exists in the interlayer for glass laminates obtained above was measured like Example 19.

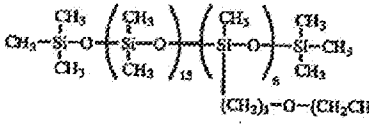
[0200]In manufacture of the interlayer for example 21 glass laminates, the interlayer for glass laminates and the glass laminate were obtained like Example 19 instead of 0.08 copy of octanoic acid magnesium as an adhesive regulator except having added 0.04 copy of magnesium chloride. It was 2 micrometers when the particle diameter of the magnesium salt which exists in the interlayer for glass laminates obtained above was measured like Example 19.

[0201]In manufacture of example 22 polyvinyl-acetal resin, as a neutralizer, Instead of sodium hydroxide solution, the average degree of polymerization 1700, and% of the powdered amount white

yvinyl butyral resin of degree % and survival acetyl groups of formation of average butyral of 64
l of 1 mol were obtained like Example 19 except having used basic magnesium carbonate.
bsequently, instead of 100 copies of polyvinyl butyral resin obtained in Example 19 in manufacture
he interlayer for glass laminates, The interlayer for glass laminates and the glass laminate were
ained like Example 19 using 100 copies of polyvinyl butyral resin obtained above except not having
led 0.08 copy of octanoic acid magnesium as an adhesive strength regulator. The particle diameter
).7 ppm and sodium salt of the sodium content in an interlayer was less than 0.5 micrometer. It
s 2 micrometers when the particle diameter of the magnesium salt which exists in an interlayer
s measured like Example 19.
02]In manufacture of example 23 polyvinyl-acetal resin, as a neutralizer, Instead of sodium
droxide solution, the average degree of polymerization 1700, and% of the powdered amount white
yvinyl butyral resin of degree % and survival acetyl groups of formation of average butyral of 64
l of 1 mol were obtained like Example 19 except having used the magnesium hydroxide solution.
bsequently, instead of 100 copies of polyvinyl butyral resin obtained in Example 19 in manufacture
he interlayer for glass laminates, The interlayer for glass laminates and the glass laminate were
ained like Example 19 using 100 copies of polyvinyl butyral resin obtained above except not having
led 0.08 copy of octanoic acid magnesium as an adhesive strength regulator. The particle diameter
).7 ppm and sodium salt of the sodium content was less than 0.5 micrometer. It was 2.5
rometers when the particle diameter of the magnesium salt which exists in an interlayer was
ssured like Example 19.
03]In manufacture of the interlayer for comparative example 6 glass laminates, as an adhesive
ulator, The interlayer for glass laminates and the glass laminate were obtained like Example 19
ept having added 0.04 copy of magnesium acetate which is hard to dissolve in polyvinyl butyral
in or a plasticizer instead of 0.08 copy of octanoic acid magnesium. It was 10 micrometers when
particle diameter of the magnesium salt which exists in the interlayer for glass laminates obtained
ve was measured like Example 19.
04]In manufacture of the interlayer for comparative example 7 glass laminates, as an adhesive
ulator, The interlayer for glass laminates and the glass laminate were obtained like Example 19
ept having added 0.05 copy of butanoic acid which is 0.04 copy of magnesium acetate and short
in system organic acid which are hard to dissolve in polyvinyl butyral resin or a plasticizer instead
).08 copy of octanoic acid magnesium. It was 4 micrometers when the particle diameter of the
gnesium salt which exists in the interlayer for glass laminates obtained above was measured like
mple 19.
05]The humidity test of the interlayer for glass laminates obtained by Examples 19-23 and the
nparative examples 6 and 7 was done like Example 1. The result was as being shown in Table 7.
06]
ble 7]

	実施例					比較例	
	1 9	2 0	2 1	2 2	2 3	6	7
アセタール基総炭素数	4	4	4	4	4	4	4
平均ブチラール化度（モル%）	64.0	64.0	64.0	64.0	64.0	64.0	64.0
残存アセチル基量（モル%）	1.0	1.0	1.0	1.0	1.0	1.0	1.0
平均重合度	1700	1700	1700	1700	1700	1700	1700
可塑剤量（重量部）	40	40	40	40	40	40	40
ナトリウム濃度(ppm)	10	10	10	0.7	0.7	10	10
ナトリウム粒径（μm）	1.0	1.0	1.0	0.5>	0.5>	1.0	1.0
マグネシウム塩添加量（重量部）	0.08	0.08	0.04	0	0	0.04	0.04
マグネシウム塩の粒径（μm）	2.0	0.5	2.0	2.0	2.0	10.0	4.0
温2 1時間後のヘイズ（%）	19.0	16.4	26.8	25.4	28.5	92.0	87.2
耐湿	○	○	○	○	○	×	×

[0207]The glass laminate of Examples 19-23 by this invention showed the outstanding moisture resistance so that clearly from Table 7. On the other hand, the glass laminate of the comparative examples 6 and 7 with the particle diameter of greater than 3 micrometers of the magnesium salt which exists in a glass laminate interlayer had bad moisture resistance.
[0208]Example 24 composition / preparation (composition of polyvinyl butyral resin) ion-exchange-water 2900 weight section, it heated and dissolved in 95 **, having supplied degree% of polyvinyl alcohol of saponification of 99.2 mol 198 weight section (4.5 mol of vinyl alcohol considerable amount) to the reactor with an agitating device, and agitating it with the average degree of polymerization 1700. After cooled this solution at 30 **, having added 35-% of the weight chloride 208 weight section (2.1 mol) and n-butylaldehyde 152 weight section (2.1 mol), lowering solution temperature subsequently to 2 **, holding this temperature and polyvinyl butyral resin's depositing, temperature up of the solution temperature was carried out to 30 **, and it was held for 5 hours. After holding, sodium bicarbonate 156 weight section (1.8 mol) was added, it neutralized, rinsing and desiccation were performed, and the degree% of polyvinyl butyral resin of butyral-izing of 65 mol was obtained. It was 50 ppm when the sodium content of the obtained polyvinyl butyral resin was measured by ICP emission spectrometry. The particle diameter of sodium salt was 12 micrometers.
[0209](Production of a resin layer) Polyvinyl-butyral-resin 100 obtained weight section, Triethylene-glycol-di-2-ethyl-butyrate 40 weight section, ethylenediaminetetraacetic acid 0.05 weight section, Press forming of the kneaded material produced by supplying 2-ethylbutanoic acid magnesium 0.04 weight section and modified silicone oil 0.05 weight section to a roll mill, and kneading them was carried out for 30 minutes on condition of 150 ** and 120 kg/cm^2 with the press-forming machine, and the 0.8-mm-thick resin layer was obtained. About the obtained resin layer, the same humidity test as Example 1 was done. As modified silicone oil, what is expressed with a following chemical formula was used.
[0210]
[Formula 7]



[0211]Instead of example 25 ethylenediaminetetraacetic-acid 0.05 weight section, the resin layer was obtained and evaluated like Example 24 except having used salicylaldehyde 0.08 weight section. The result was shown in Table 8.
[0212]Instead of example 26 ethylenediaminetetraacetic-acid 0.05 weight section, the resin layer was obtained and evaluated like Example 24 except having used oxalic acid 1.0 weight section. The result was shown in Table 8.
[0213]Instead of example 27 ethylenediaminetetraacetic-acid 0.05 weight section, the resin layer was obtained and evaluated like Example 24 except having used 1,10-phenanthroline 0.03 weight section. The result was shown in Table 8.
[0214]Instead of example 28 ethylenediaminetetraacetic-acid 0.05 weight section, the resin layer was obtained and evaluated like Example 24 except having used acetylacetone 0.3 weight section. The result was shown in Table 8.
[0215]The resin layer was obtained and evaluated like Example 24 except not having used comparative example 8 ethylenediaminetetraacetic-acid 0.05 weight section. The result was shown in Table 8.
[0216]Instead of comparative example 9 ethylenediaminetetraacetic-acid 0.05 weight section, the resin layer was obtained and evaluated like Example 24 except having used acetone 0.1 weight section. The result was shown in Table 8.
[0217]
[Table 8]

	アセタール化脂（重量部）	ジエステル系化合物（重量部）	結晶形成化合物		ｎ酪酸のマグネシウム塩（重量部）	変成シリコーンオイル（重量部）	水浸漬２４時間後のヘイズ（％）
			種類	重量部			
24	100	40	ｽﾃｱﾘﾙｱﾙｺｰﾙ酢酸塩	0.05	0．04	0．05	26．9
25	100	40	ﾍﾍﾍﾍﾍﾍﾍﾍﾍﾍ	0.08	0．04	0．05	29．5
26	100	40	シュウ酸	1．0	0．04	0．05	35．8
27	100	40	1,10-ﾃﾞｶﾝｼﾞｶﾙﾎﾞﾝ	0.03	0．04	0．05	39．5
28	100	40	アセチルアセトン	0．3	0．04	0．05	38．0
8	100	40	なし	－	－	0．05	77．0
9	100	40	アセトン	0．1	－	0．05	82．0

18]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of onification of 98.9 mol to the preparation pure water 2890g of example 29(1) polyvinyl-acetal resin warming --- it dissolved. Temperature control of the system of reaction was carried out to 12 **, g of 35-% of the weight chloride catalysts and the n-butylaldehyde 148g were added, this perature was held, and the reactant was deposited. With superfluous water, hold the system of ction at 45 ** for 3 hours, make a reaction complete, wash, and Then, unreacted n-butylaldehyde shout, The sodium hydroxide solution which is a general-purpose neutralizer neutralized the oride catalyst, and also white powdered polyvinyl butyral resin was obtained through rinsing and iccation for 2 hours with superfluous water. The amount of 64-mol % and survival acetyl groups of degree of formation of average butyral of this resin was 1-mol %.

19](2) manufacture profit **** polyvinyl butyral resin (average-degree-of-polymerization 1700 l degree % of 64 mol of formation of average butyral.) of the interlayer for glass laminates To ount of residual acetyl groups 1 mol %100 copy, as a plasticizer 40 copies of triethylene glycol di- thyl butyrate, And 0.13 copy of dimethyl octylamine is added as 0.75 copy of decylbenzenesulfonic acid, and amine as organic acid, After carrying out melt kneading enough with oll mill, press forming was carried out for 30 minutes at 150 ** using the press-forming machine, f the interlayer for glass laminates of 0.76 mm of average thickness was obtained. It was 50 ppm en the sodium content of the obtained interlayer was measured by ICP emission spectrometry. It s 4 micrometers when the particle diameter of the sodium element which exists in an interlayer s measured using the time-of-flight type secondary-ion-mass-spectroscopy device (TOF-SIMS).

20](3) It inserts from both sides using the manufacture above-mentioned interlayer of a glass inate with a transparent float glass (30 cm by 30 cmx3 mm in thickness). After putting this in in rubber bag and carrying out indirect desulfurization mind with the degree of vacuum of 20torr for minutes, it moved to 90 ** oven, deaerated, and the vacuum press was carried out, holding for 30 utes at 80 more **. Thus, this adhesion was performed for the glass laminate by which preliminary ression was carried out for 20 minutes on condition of the temperature of 135 **, and pressure 12 kg/cm^2 in air type autoclave, and the glass laminate was obtained. About the obtained glass laminate erlayer, the humidity test was done like Example 1 and the result was shown in Table 9.

21]In manufacture of the interlayer for example 30 glass laminates, 0.30 copy of octanoic acid is ed instead of 0.75 copy of dodecylbenzenesulfonic acid as organic acid, Except having added 0.35 y of decyl amine instead of 0.13 copy of dimethyl octylamine as amine, the resin layer was ained like Example 29 and the evaluated result was shown in Table 9. It was 5 micrometers when particle diameter of the sodium element which exists in the obtained interlayer was measured like mple 29.

22]In manufacture of the interlayer for example 31 glass laminates, except having added 0.20 copy di(2-ethylhexyl) phosphoric acid instead of 0.75 copy of dodecylbenzenesulfonic acid as organic d, the resin layer was obtained like Example 29 and the evaluated result was shown in Table 9. It s 2 micrometers when the particle diameter of the sodium element which exists in the obtained erlayer was measured like Example 29.

23]In manufacture of the interlayer for comparative example 10 glass laminates, except not having ed the organic acid and amine of the dispersing agent, the resin layer was obtained like Example and the evaluated result was shown in Table 9. It was 20 micrometers when the particle diameter

of the sodium element which exists in the obtained interlayer was measured like Example 29.

[0224]In manufacture of the interlayer for comparative example 11 glass laminates, except not having added the organic acid and amine of the dispersing agent, and having changed washing time from 2 hours in 3 hours, the resin layer was obtained like Example 29 and the evaluated result was shown in Table 9. It was 30 ppm when the sodium content which exists in the obtained interlayer was measured like Example 29. It was 13 micrometers when the particle diameter of the sodium element was measured like Example 29.

[0225]

(Table 9)

		実施例			比較例	
		29	30	31	10	11
中間膜	アセタール基炭素数	4	4	4	4	4
	平均アセタール化度（モル％）	64.0	64.0	64.0	64.0	64.0
	残存アセチル基量（モル％）	1.0	1.0	1.0	1.0	1.0
	平均重合度	1700	1700	1700	1700	1700
	可塑剤量（重量部）	40	40	40	40	40
	ナトリウム濃度(ppm)	50	50	50	50	50
	ナトリウム粒径（μm）	4	5	3	20	13
水浸漬２４時間後のヘイズ		28	28	28	82	72
総合判定		○	○	○	×	×

[0226]Example 32 composition / preparation (composition of polyvinyl butyral resin) ion-exchange-water 2900 weight section, It heated and dissolved in 95 **, having supplied degree% of polyvinyl alcohol of saponification of 99.2 mol 198 weight section (4.5 mol of vinyl alcohol considerable amount) to the reactor with an agitating device, and agitating it with the average degree of polymerization 1700. After cooled this solution at 30 **, having added 35-% of the weight chloride 196 weight section (1.9 mol) and n-butylaldehyde 152 weight section (2.1 mol), lowering solution temperature subsequently to 2 **, holding this temperature and polyvinyl butyral resin's depositing, temperature up of the solution temperature was carried out to 30 **, and it was held for 5 hours. After holding, sodium bicarbonate 147 weight section (1.7 mol) was added, it neutralized, rinsing and desiccation were performed, and the degree% of polyvinyl butyral resin of butyral-izing of 65 mol was obtained. It was 50 ppm when the sodium content of the obtained polyvinyl butyral resin was measured by ICP emission spectrometry. The particle diameter of sodium salt was 12 micrometers.

[0227](Production of a resin layer) Polyvinyl-butyral-resin 100 obtained weight section, Triethylene-glycol-di-2-ethyl-butyrate 40 weight section, p-toluenesulfonic-acid 0.43 weight section, And press forming of the kneaded material produced by supplying hexylamine 0.23 weight section to a roll mill, and kneading it was carried out for 10 minutes on condition of 150 ** and 120 kg/cm^2 with the press-forming machine, and the 0.8-mm-thick resin layer was obtained. The obtained resin layer was used and the moisture-proof white-blush-mark sex test was done like Example 1. The result was shown in Table 10.

[0228]Instead of example 33 hexylamine 0.23 weight section, the resin layer was obtained and evaluated like Example 32 except having used tetradecylamine 0.49 weight section. The result was shown in Table 10.

[0229]Instead of example 34 p-toluenesulfonic-acid 0.43 weight section, the resin layer was obtained and evaluated like Example 32 except having used dodecylbenzenesulfonic acid 0.75 weight section. The result was shown in Table 10.

[0230]The resin layer was obtained and evaluated like Example 32 instead of example 35 p-toluenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight section except having used

decylbenzenesulfonic acid 0.15 weight section and decyl amine 0.07 weight section. The result was wn in Table 10.

31]The resin layer was obtained and evaluated like Example 32 instead of example 38 p-uenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight section except having used decylbenzenesulfonic acid 0.75 weight section and decyl amine 0.36 weight section. The result was wn in Table 10.

32]The resin layer was obtained and evaluated like Example 32 instead of example 37 p-uenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight section except having used decylbenzenesulfonic acid 0.75 weight section and dodecyl amine 0.42 weight section. The result s shown in Table 10.

33]The resin layer was obtained and evaluated like Example 32 instead of example 38 p-uenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight section except having used decylbenzenesulfonic acid 0.75 weight section and N,N-dioctyl amine 0.55 weight section. The ult was shown in Table 10.

34]Instead of example 39 p-toluenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight ction, The resin layer was obtained and evaluated like Example 32 except having used decylbenzenesulfonic acid 0.37 weight section and N,N-dimethyl octylamine 0.18 weight section. e result was shown in Table 10.

35]Instead of example 40 p-toluenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight ction, The resin layer was obtained and evaluated like Example 32 except having used decylbenzenesulfonic acid 0.75 weight section and N,N-dimethyl octylamine 0.36 weight section. e result was shown in Table 10.

36]Instead of example 41 p-toluenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight ction, The resin layer was obtained and evaluated like Example 32 except having used decylbenzenesulfonic acid 0.75 weight section and N,N-dimethyldodecyl amine 0.49 weight section. e result was shown in Table 10.

37]The resin layer was obtained and evaluated like Example 32 except not having used mparative example 12 p-toluenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight ction. The result was shown in Table 10.

38]Comparative example 13 p-toluenesulfonic-acid 0.43 weight section was not used, but the in layer was obtained and evaluated like Example 32 instead of hexylamine 0.23 weight section cept having used decyl amine 0.36 weight section. The result was shown in Table 10.

39]The resin layer was obtained and evaluated like Example 32 except not having used mparative example 14 hexylamine 0.23 weight section. The result was shown in Table 10.

40]The resin layer was obtained and evaluated like Example 32 instead of comparative example 15 oluenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight section except having used lium dodecylbenzenesulfonate 0.80 weight section. The result was shown in Table 10.

41]The resin layer was obtained and evaluated like Example 32 instead of comparative example 16 oluenesulfonic-acid 0.43 weight section and hexylamine 0.23 weight section except having used decyl-trimethylammonium-chloride 0.33 weight section. The result was shown in Table 10.

42]

ble 10]

		スルホン酸		アミン				水浸漬24時間後のヘイズ(%)
		種類	重量部数	R'	R"	R'''	重量部数	
実施例	32	p-ﾄﾙｴﾝｽﾙﾎﾝ酸	0.43	ﾍｷｼﾙ	H	H	0.23	29.1
	33	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.43	ﾄﾘｵｸﾁﾙ	H	H	0.40	15.6
	34	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.75	ﾍｷｼﾙ	H	H	0.23	22.8
	35	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.15	ﾃﾞｼﾙ	H	H	0.07	21.8
	36	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.75	ﾃﾞｼﾙ	H	H	0.36	17.1
	37	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.75	ｵｸﾁﾙ	H	H	0.42	20.1
	38	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.75	ｵｸﾁﾙ	ｵｸﾁﾙ	H	0.55	32.4
	39	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.37	ｵｸﾁﾙ	メチル	メチル	0.18	20.3
	40	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.75	ｵｸﾁﾙ	メチル	メチル	0.36	23.1
	41	ﾄﾞﾃﾞｼﾙﾍﾞﾝｾﾞﾝｽﾙﾎﾝ酸	0.75	ﾃﾞｼﾙ	メチル	メチル	0.49	29.1
比較例	12	—	0	—	—	—	0	77.6
	13	—	0	ﾃﾞｼﾙ	H	H	0.36	85.9
	14	p-ﾄﾙｴﾝｽﾙﾎﾝ酸	0.43	—	—	—	0	溶解変化
	15	ドデシルベンゼンスルホン酸ナトリウム					0.80	75.8
	16	ドデシルトリメチルアンモニウムクロライド					0.33	80.6

[0243]The polyvinyl butyral resin compounded in example 42 (preparation of polyvinyl butyral resin) Example 32 was rinsed and dried further, and the polyvinyl butyral resin which reduced the content of sodium salt was obtained. It was 20 ppm when the sodium content of the obtained polyvinyl butyral resin was measured by ICP emission spectrometry. The particle diameter of sodium salt was 3.5 micrometers.

[0244](Production of a resin layer) Polyvinyl-butyral-resin 100 obtained weight section, On the same conditions as Example 32, it kneaded, press forming of triethylene-glycol-di-2-ethyl-butyrate 40 weight section, dodecylbenzenesulfonic acid 0.33 weight section, and the decyl amine 0.17 weight section was carried out, and the 0.8-mm-thick resin layer was obtained. About the obtained resin layer, the moisture-proof white-blush-mark sex test was done like Example 1. The result was shown in Table 11.

[0245]The resin layer was obtained and evaluated like Example 42 instead of example 43 dodecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 weight section except having used dodecylbenzenesulfonic acid 0.17 weight section and decyl amine 0.09 weight section. The result was shown in Table 11.

[0246]The resin layer was obtained and evaluated like Example 42 instead of example 44 dodecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 weight section except having used dodecylbenzenesulfonic acid 0.03 weight section and decyl amine 0.02 weight section. The result was shown in Table 11.

[0247]Instead of example 45 decyl amine 0.17 weight section, the resin layer was obtained and evaluated like Example 42 except having used N,N-dimethyl octylamine 0.17 weight section. The result was shown in Table 11.

[0248]Instead of example 46 dodecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 weight section, The resin layer was obtained and evaluated like Example 42 except having used dodecylbenzenesulfonic acid 0.17 weight section and N,N-dimethyl octylamine 0.09 weight section. The result was shown in Table 11.

[0249]Instead of example 47 dodecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 weight section, The resin layer was obtained and evaluated like Example 42 except having used dodecylbenzenesulfonic acid 0.03 weight section and N,N-dimethyl octylamine 0.02 weight section. The result was shown in Table 11.

[0250]Instead of example 48 dodecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 weight section, The resin layer was obtained and evaluated like Example 42 except having used dodecylbenzenesulfonic acid 0.30 weight section and N,N-dimethyldodecyl amine 0.20 weight section. The result was shown in Table 11.

51]Instead of example 49 dodecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 ght section, The resin layer was obtained and evaluated like Example 42 except having used lecylbenzenesulfonic acid 0.12 weight section and N,N-dimethyldodecyl amine 0.08 weight section. s result was shown in Table 11.
52]The resin layer was obtained and evaluated like Example 42 except not having used nparative example 17 dodecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 ght section. The result was shown in Table 11.
53]Comparative example 18 dodecylbenzenesulfonic-acid 0.33 weight section was not used, but resin layer was obtained and evaluated like Example 42 instead of decyl amine 0.17 weight tion except having used decyl amine 0.36 weight section. The result was shown in Table 11.
54]The resin layer was obtained and evaluated like Example 42 instead of comparative example 19 lecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 weight section except having d dodecylbenzenesulfonic acid 0.30 weight section. The result was shown in Table 11.
55]The resin layer was obtained and evaluated like Example 42 instead of comparative example 20 lecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 weight section except having d sodium dodecylbenzenesulfonate 0.50 weight section. The result was shown in Table 11.
56]The resin layer was obtained and evaluated like Example 42 instead of comparative example 21 lecylbenzenesulfonic-acid 0.33 weight section and decyl amine 0.17 weight section except having d dodecyl-trimethylammonium-chloride 0.50 weight section. The result was shown in Table 11.
57]
ble 11]

	スルホン酸		アミン				水浸漬24時間後のヘイズ(%)
	種類	添加部数	R'	R'	R'	添加部数	
42	ドデシルベンゼンスルホン酸	0.33	デシル	H	H	0.17	18.8
43	ドデシルベンゼンスルホン酸	0.17	デシル	H	H	0.08	12.5
44	ドデシルベンゼンスルホン酸	0.03	デシル	H	H	0.02	17.2
45	ドデシルベンゼンスルホン酸	0.33	ドデシル	メチル	メチル	0.17	10.4
46	ドデシルベンゼンスルホン酸	0.17	ドデシル	メチル	メチル	0.09	11.2
47	ドデシルベンゼンスルホン酸	0.03	ドデシル	メチル	メチル	0.02	13.6
48	ドデシルベンゼンスルホン酸	0.30	ドデシル	メチル	メチル	0.20	16.4
49	ドデシルベンゼンスルホン酸	0.12	ドデシル	メチル	メチル	0.08	17.2
17	-	0	-	-	-	0	38.4
18	-	0	デシル	H	H	0.36	39.2
19	ドデシルベンゼンスルホン酸	0.30	-	-	-	0	複数劣化
20	ドデシルベンゼンスルホン酸ナトリウム					0.50	66.4
21	ドデシルトリメチルアンモニウムクロライド					0.50	54.7

58]Polyvinyl-butyral-resin 100 weight section compounded in example 50 Example 32, On the ne conditions as Example 32, it kneaded, press forming of triethylene-glycol-di-2-ethyl-butyrate weight section, octanoic acid 0.30 weight section, and the decyl amine 0.35 weight section was ried out, and the 0.8-mm-thick resin layer was obtained. About the obtained resin layer, the isture-proof white-blush-mark sex test was done like Example 1. The result was shown in Table

59]Instead of example 51 decyl amine 0.35 weight section, the resin layer was obtained and luated like Example 50 except having used dodecyl amine 0.40 weight section. The result was wn in Table 12.
60]Instead of example 52 decyl amine 0.35 weight section, the resin layer was obtained and luated like Example 50 except having used tetradecylamine 0.45 weight section. The result was wn in Table 12.
61]The resin layer was obtained and evaluated like Example 50 instead of example 53 octanoic- d 0.30 weight section and decyl amine 0.35 weight section except having used myristic acid 0.50

weight section and dodecyl amine 0.40 weight section. The result was shown in Table 12.
[0262]Instead of example 54 decyl amine 0.35 weight section, the resin layer was obtained and evaluated like Example 50 except having used N,N-dimethyldodecyl amine 0.45 weight section. The result was shown in Table 12.
[0263]The resin layer was obtained and evaluated like Example 50 instead of example 55 octanoic-acid 0.30 weight section and decyl amine 0.35 weight section except having used benzoic acid 0.30 weight section and dodecyl amine 0.40 weight section. The result was shown in Table 12.
[0264]The resin layer was obtained and evaluated like Example 50 except not having used comparative example 22 decyl amine 0.35 weight section. The result was shown in Table 12.
[0265]
[Table 12]

		カルボン酸		アミン				水浸漬24時間後のヘイズ(%)
		種類	添加部数	R'	R'	R'	添加部数	
実施例	50	オクタン酸	0.30	デシル	H	H	0.35	23.4
	51	オクタン酸	0.30	ドデシル	H	H	0.40	24.3
	52	オクタン酸	0.30	テトラデシル	H	H	0.35	23.7
	53	ミリスチン酸	0.50	ドデシル	H	H	0.40	29.8
	54	オクタン酸	0.30	ドデシル	メチル	メチル	0.45	29.8
	55	安息香酸	0.30	ドデシル	H	H	0.40	27.6
比較例	22	オクタン酸	0.30	-	-	-	0	73.6

[0266]Polyvinyl-butyral-resin 100 weight section prepared in example 56 Example 42, On the same conditions as Example 32, it kneaded, press forming of triethylene-glycol-di-2-ethyl-butyrate 40 weight section, JI (n-butyl) phosphoric acid 0.16 weight section, and the dodecyl amine 0.14 weight section was carried out, and the 0.8-mm-thick resin layer was obtained. About the obtained resin layer, the moisture-proof white-blush-mark sex test was done like Example 1. After manufacturing the glass laminate like Example 1 using the obtained resin layer and neglecting it for four weeks under the atmosphere of 50 ** and 95%RH, an adhesive (pan Meru) examination which is in Example 1 was carried out, and the adhesive property of the glass peripheral part which absorbed moisture was investigated. When the periphery had a portion (pan Meru 0-1) with remarkable exfoliation of glass compared with the center section at this time, the width of this portion was measured and it was considered as exfoliation distance. The result was shown in Table 13.
[0267]The resin layer was obtained and evaluated like Example 56 instead of example 57 JI (n-butyl) phosphoric acid 0.16 weight section and dodecyl amine 0.14 weight except having used JI (n-butyl) phosphoric acid 0.17 weight section and N,N-dimethyl octylamine 0.13 weight section. The result was shown in Table 13.
[0268]The resin layer was obtained and evaluated like Example 56 instead of example 58 JI (n-butyl) phosphoric acid 0.16 weight section and dodecyl amine 0.14 weight except having used JI (n-ethylhexyl) phosphoric acid 0.19 weight section and dodecyl amine 0.11 weight section. The result was shown in Table 13.
[0269]The resin layer was obtained and evaluated like Example 56 instead of example 59 JI (n-butyl) phosphoric acid 0.16 weight section and dodecyl amine 0.14 weight except having used JI (n-ethylhexyl) phosphoric acid 0.20 weight section and N,N-dimethyl octylamine 0.10 weight section. The result was shown in Table 13.
[0270]The resin layer was obtained and evaluated like Example 56 instead of example 60 JI (n-butyl) phosphoric acid 0.16 weight section and dodecyl amine 0.14 weight except having used JI (n-dodecyl) phosphoric acid 0.20 weight section and dodecyl amine 0.10 weight section. The result was shown in Table 13.
[0271]The resin layer was obtained and evaluated like Example 56 instead of example 61 JI (n-butyl) phosphoric acid 0.16 weight section and dodecyl amine 0.14 weight except having used JI (2-dodecyl)

isphoric acid 0.21 weight section and N,N-dimethyl octylamine 0.09 weight section. The result was wn in Table 13.

72]The resin layer was obtained and evaluated like Example 56 instead of example 62 JI (n-butyl) isphoric acid 0.16 weight section and dodecyl amine 0.14 weight except having used enylphosphoric acid 0.17 weight section and dodecyl amine 0.13 weight section. The result was wn in Table 13.

73]The resin layer was obtained and evaluated like Example 56 instead of comparative example 23 n-butyl) phosphoric acid 0.16 weight section and dodecyl amine 0.14 weight except having used no (n-dodecyl) sodium phosphate 0.30 weight section. The result was shown in Table 13.

74]The resin layer was obtained and evaluated like Example 56 instead of comparative example 24 n-butyl) phosphoric acid 0.16 weight section and dodecyl amine 0.14 weight except having used lecyl-trimethylammonium-chloride 0.33 weight section. The result was shown in Table 13.

75]

ble 13]

	リン酸			アミン				水浸漬24時間後のヘイズ (%)	剥離強度 (N/25)
	R⁴	R⁵	添加部数	R¹	R²	R³	添加部数		
58	n-ブチル	n-ブチル	0.16	ドデシル	H	H	0.14	16.5	0
57	n-ブチル	n-ブチル	0.17	ドデシル	メチル	メチル	0.13	17.2	0
58	2-エチルヘキシル	2-エチルヘキシル	0.19	ドデシル	H	H	0.11	12.6	0
59	2-エチルヘキシル	2-エチルヘキシル	0.20	ドデシル	メチル	メチル	0.10	14.6	0
60	n-ドデシル	n-ドデシル	0.20	ドデシル	H	H	0.16	13.4	0
61	n-ドデシル	n-ドデシル	0.21	ドデシル	メチル	メチル	0.09	15.6	0
62	フェニル	フェニル	0.17	ドデシル	H	H	0.13	16.7	0
63	n-ドデシルリン酸ナトリウム						0.30	52.6	9
64	ドデシルトリメチルアンモニウムクロライド						0.33	54.7	11

76]adding the average degree of polymerization 1700, and the saponification degree% of polyvinyl ohol 275g of 98.9 mol to the preparation pure water 2890g of example 63(1) polyvinyl-acetal resin warming — it dissolved. Temperature control of the system of reaction was carried out to 12 **, of the weight of chloride catalysts [201 g of] and the n-butylaldehyde 148g were added, this perature was held, and the reactant was deposited. Then, hold the system of reaction at 45 ** for ours, make a reaction complete, superfluous water washes, and unreacted n-butylaldehyde is shed, The sodium hydroxide solution which is a neutralizer neutralized the chloride catalyst. still re superfluous water performed rinsing and desiccation for 2 hours, and white powdered polyvinyl tyral resin was obtained. As for the amount of residual acetyl groups, the content [of the average ree of polymerization of the obtained polyvinyl butyral resin] of neutralizing salt (NaCl) of the idual vinyl alcohol component amount was [1700 and degree of butyral-izing] 2 micrometers in ticle diameter of 20 ppm and neutralizing salt in sodium concentration 34-mol% 1-mol% 65-mol%.

77](2) As opposed to 100 copies of polyvinyl butyral resin obtained by the manufacture above of interlayer for glass laminates, As a plasticizer, 40 copies of triethylene glycol di-2-ethyl butyrate (3H), 0.071 copy (2.8x10 $^{-4}$ mol) of magnesium 2-ethylbutanoate (carbon number 6), the ultraviolet absorbent, and the antioxidant were added as metal salt (adhesive strength regulator) of boxylic acid, and stirring mixing was carried out uniformly. The content of the organic acid in ve-mentioned 3GH was 100 ppm. Subsequently, the small extrusion machine (made by a trade e "lab PURASUTO mill" Oriental energy machine company) was equipped with the T die, and on the extrusion temperature of 80-180 **, and a metallic mold outlet temperature of 200 ** nditions, the mixture obtained above was extruded, the film was produced, and the interlayer for ss laminates about 0.8 mm thick was obtained.

78](3) After controlling the humidity of the interlayer for glass laminates obtained by the nufacture above of the glass laminate so that water content may be 0.4 to 0.5 % of the weight in air-conditioned room, it put between two float glasses (2.4 mm in thickness), and preliminary ression was carried out by the rolling method. Subsequently, actual adhesion of the layered product which preliminary adhesion was carried out was carried out on condition of the temperature of 130

**, and pressure 13 kg/cm^2 in autoclave, and the glass laminate was obtained.

[0279](4) The following methods estimated the pan Meru value of the performance of the glass laminate obtained by the evaluation above. The method of the statement estimated moisture resistance in the Example 1. The result was as being shown in Table 14.

[0280]Valuation method (1) The head struck the glass laminate which was neglected for 16 hours and carried out temperature control under pan Meru value-18**0.6 ** temperature with the hammer which is 0.45 kg, and it ground until the particle diameter of glass was set to 6 mm or less. subsequently — following the judging standard which judges with the boundary sample which carried out grade attachment of the degree of exposure of the interlayer after glass carries out partial avulsion beforehand, and shows the result in Table 1 — as a pan Meru value — a table — the bottom, a pan Meru value -- (h) primary stage and (**) 50** — one month after [-] and (**) 50** -- it asked about three conditions two months after --. The adhesive strength of an interlayer and glass is also so large that the above-mentioned pan-mel value is large, and the adhesive strength of an interlayer and glass is also so small that a pan Meru value is small.

[0281]The interlayer for glass laminates and the glass laminate were obtained like Example 63 except having made metal salt of carboxylic acid as shown in Table 14 as Example 64 - a 69 adhesive-strength regulator contain.

[0282]In manufacture of the interlayer for comparative example 25 glass laminates, as metal salt of carboxylic acid, instead of 0.071 copy of magnesium 2-ethylbutanoate, the interlayer for glass laminates and the glass laminate were obtained like Example 63 except having added 0.04 copy (2.8x10 $^{-4}$ mol) of magnesium acetate (carbon number 2).

[0283]The interlayer for glass laminates and the glass laminate were obtained like Example 63 except having made metal salt of carboxylic acid as shown in Table 14 as a comparative example 26 adhesive-strength regulator contain.

[0284]The performance of the glass laminate obtained by Examples 64-69 and the comparative examples 25 and 26 was evaluated like Example 63. The result was as being shown in Table 14.

[0285]

[Table 14]

		可塑剤	カルボン酸の金属塩（接着力調整剤）		パンメル値			水浸漬24時間後のヘイズ (%)
		種類（添加量）	種類	添加量（×10⁻⁴モル）	初期	経時後A	経時後B	
実施例	63	3GH（40）	2-エチルブタン酸マグネシウム	0.071（2.8）	5	5	5	11
	64	3GH（40）	ヘプタン酸マグネシウム	0.063（2.8）	5	5	5	48
	65	3GH（40）	2-エチルヘキサン酸亜鉛	0.088（3.0）	5	4	4	38
	66	3GH（40）	ヘプタン酸カリウム	0.045（3.2）	5	5	5	27
	67	3GH（40）	2-エチルヘキサン酸マグネシウム	0.079（2.8）	5	3	2	36
	68	3GH（40）	2-エチルヘキサン酸マグネシウム	0.087（2.8）	5	3	2	31
	69	3GH（40）	ラウリン酸マグネシウム	0.102（2.8）	5	1	1	26
比較例	25	3GH（40）	酢酸マグネシウム	0.040（2.8）	5	5	5	52
	26	3GH（40）	ヴァレリン酸マグネシウム	0.056（2.8）	5	5	5	30

[0286]the polyvinyl butyral resin (average-degree-of-polymerization 1650 and degree % of 67 mol of butyral-izing.) which adjusted the combination presentation of the interlayer for example 70 glass laminates like the case of Example 65 as polyvinyl-acetal resin 32 mol of amount % and survival vinyl alcohol component amount % of residual acetyl groups of 1 mol, As the sodium content of 20 ppm, 100 copies of particle diameter of 2 micrometers of neutralizing salt, and a plasticizer, 38 copies of triethylene glycol di-2-ethylhexanoate (3GO), The interlayer for glass laminates was obtained like Example 63 except having considered it as 0.071 copy (2.8x10 $^{-4}$ mol) of magnesium 2-ethylbutanoate (carbon number 6), the ultraviolet ray absorbent, and the antioxidant as metal salt of carboxylic acid. The glass laminate was obtained like Example 63 using the interlayer for glass laminates obtained above.

[0287]The interlayer for glass laminates and the glass laminate were obtained like Example 70 except having made metal salt of carboxylic acid as shown in Table 15 as Example 71 and a 72 adhesive-

ength regulator contain.
'88]the polyvinyl butyral resin (average-degree-of-polymerization 1650 and degree % of 67 mol of yral-izing.) which set sodium content of neutralizing salt (sodium chloride) to 10 ppm by washing pure water as example 73 polyvinyl-acetal resin The interlayer for glass laminates and the glass inate were obtained like Example 70 except having used 32 mol of amount % and survival vinyl ohol component amount % of residual acetyl groups of 1 mol.
'89]The interlayer for glass laminates and the glass laminate were obtained like Example 70 except ing made metal salt of carboxylic acid as shown in Table 15 as Example 74 – a 78 adhesive-ength regulator contain.
'90]In manufacture of the interlayer for comparative example 27 glass laminates, as metal salt of boxylic acid, Instead of 0.071 copy of magnesium 2-ethylbutanoate, the interlayer for glass inates and the glass laminate were obtained like Example 70 except having added 0.04 copy 8x10 $^{-4}$ mol) of magnesium acetate (carbon number 2).
91]The performance of the glass laminate obtained by Examples 70–78 and the comparative mple 27 was evaluated like Example 63. The result was as being shown in Table 15.
92]
ble 15]

	可塑剤	カルボン酸の金属塩（接着力調整剤）		パンメル値			水浸漬２４時間後のヘイズ（%）
	種類（添加量）	種類	添加量（×10^{-4}モル）	初期	経時後A	経時後B	
70	3G8（38）	2-エチルブタン酸マグネシウム	0.071（2.8）	5	5	5	42
71	3G8（38）	酢酸マグネシウム	0.087（2.8）	5	5	4	34
72	3G8（38）	2-エチルヘキサン酸マグネシウム半量カリウム	0.061（2.9） 0.021（2.5）	5	4	4	38
73	3G8（38）	2-エチルブタン酸マグネシウム	0.071（2.8）	5	5	5	21
74	3G8（38）	2-エチルペンタン酸マグネシウム	0.079（2.8）	5	3	2	37
75	3G8（38）	2-エチルヘキサン酸マグネシウム	0.087（2.8）	5	3	1	33
76	3G8（38）	酪酸マグネシウム	0.095（2.8）	5	2	1	29
77	3G8（38）	プロピオン酸マグネシウム	0.103（2.8）	5	2	1	32
78	3G8（38）	2-エチルヘキサン酸マグネシウム半量カリウム	0.061（2.6） 0.021（2.5）	5	3	2	35
27	3G8（38）	酢酸マグネシウム	0.046（2.8）	5	5	5	92

93]the combination presentation of the interlayer for example 79 glass laminates --- as polyvinyl-tal resin --- polyvinyl butyral resin (average-degree-of-polymerization 1720 and degree % of 68 of butyral-izing.) 33 mol of amount % and survival vinyl alcohol component amount % of residual tyl groups of 1 mol, As the sodium content of 20 ppm, 100 copies of particle diameter of 2 rometers of neutralizing salt, and a plasticizer, 39 copies of tetraethylene Glico Lod'z 2-ylhexanoate (4GO), The interlayer for glass laminates was obtained like Example 63 except having sidered it as 0.079 copy (2.6x10 $^{-4}$ mol) of magnesium 2-ethylpentanoate (carbon number 7), the aviolet ray absorbent, and the antioxidant as metal salt of carboxylic acid. The glass laminate was ained like Example 63 using the interlayer for glass laminates obtained above.
94]The interlayer for glass laminates and the glass laminate were obtained like Example 79 except ing made metal salt of carboxylic acid as shown in Table 16 as Example 80 – an 82 adhesive-ngth regulator contain.
95]In manufacture of the interlayer for comparative example 28 glass laminates, as metal salt of boxylic acid, Instead of 0.079 copy of magnesium 2-ethylpentanoate, the interlayer for glass inates and the glass laminate were obtained like Example 79 except having added 0.04 copy x10 $^{-4}$ mol) of magnesium acetate (carbon number 2).
96]The performance of the glass laminate obtained by Examples 79–82 and the comparative mple 28 was evaluated like Example 63. The result was as being shown in Table 16.
97]
ble 16]

		可塑剤	カルボン酸の金属塩（接着力調整剤）		パンメル値			水浸漬２４時間後のヘイズ（%）
		種類（添加量）	種類	添加量（×10^{-4}モル）	初期	経時後A	経時後B	
実施例	79	4G0（38）	2-エチルペンタン酸マグネシウム	0.079（2.8）	5	5	5	32
	80	4G0（39）	2-エチルブタン酸マグネシウム	0.071（2.8）	5	3	2	40
	81	4G0（39）	2-エチルヘキサン酸マグネシウム	0.087（2.8）	5	3	1	28
	82	4G0（38）	酪酸マグネシウム	0.095（2.8）	5	3	2	25
比較例	28	4G0（39）	酢酸マグネシウム	0.046（2.8）	5	5	5	92

[0296]The content of neutralizing salt (sodium chloride) with sodium concentration by washing according to pure water considering the combination presentation of the interlayer for example 83 glass laminates as polyvinyl-acetal resin 20 ppm, the polyvinyl butyral resin (average-degree-of-polymerization 1650 and degree % of 68 mol of butyral-izing.) made into 2 micrometers of particles of neutralizing salt Amount % of 1 mol of residual acetyl groups, residual vinyl alcohol component amount 31 mol %100 copy, As a plasticizer, as metal salt of 36 copies of dihexyl horse mackerel peats (DHA), and carboxylic acid 0.071 copy (2.8x10 $^{-4}$ mol) of magnesium 2-ethylbutanoate (carbon number 6), The interlayer for glass laminates was obtained like Example 63 except having considered it as the ultraviolet ray absorbent and the antioxidant. The glass laminate was obtained like Example 63 using the interlayer for glass laminates obtained above.
[0299]The interlayer for glass laminates and the glass laminate were obtained like Example 83 except having made metal salt of carboxylic acid as shown in Table 17 as Example 84 and an 85 adhesive-strength regulator contain.
[0300]In manufacture of the interlayer for comparative example 29 glass laminates, as metal salt of carboxylic acid, Instead of 0.071 copy of magnesium 2-ethylbutanoate, the interlayer for glass laminates and the glass laminate were obtained like Example 83 except having added 0.04 copy (2.8x10 $^{-4}$ mol) of magnesium acetate (carbon number 2).
[0301]The interlayer for glass laminates and the glass laminate were obtained like Example 83 except having made metal salt of carboxylic acid as shown in Table 17 as a comparative example 30 adhesive-strength regulator contain.
[0302]The performance of the glass laminate obtained by Examples 83–85 and the comparative examples 29 and 30 was evaluated like Example 63. The result was as being shown in Table 17.
[0303]
[Table 17]

		可塑剤	カルボン酸の金属塩（接着力調整剤）		パンメル値			水浸漬２４時間後のヘイズ（%）
		種類（添加量）	種類	添加量（×10^{-4}モル）	初期	経時後A	経時後B	
実施例	83	DHA（36）	2-エチルブタン酸マグネシウム	0.071（2.8）	5	5	4	38
	84	DHA（36）	酢酸マグネシウム	0.062（2.8）	5	5	4	46
	85	DHA（36）	2-エチルヘキサン酸マグネシウム	0.079（2.8）	5	3	2	26
比較例	29	DHA（36）	酢酸マグネシウム	0.046（2.8）	5	5	5	92
	30	DHA（36）	プロピオン酸マグネシウム	0.058（2.8）	5	5	5	84

[0304]Polyvinyl-butyral-resin 100 weight section prepared in example 86 Example 42, On the same conditions as Example 42, it kneaded, press forming of triethylene-glycol-di-2-ethyl-butyrate 40 weight section, camphor sulfonic acid 0.056 weight section, and the N,N-dimethyl octylamine 0.044 weight section was carried out, and the 0.8-mm-thick resin layer was obtained. About the obtained resin layer, the moisture-proof white-blush-mark sex test was done like Example 1. The result was shown in Table 18.
[0305]Instead of example 87 camphor sulfonic acid 0.056 weight section and N,N-dimethyl octylamine 0.044 weight section, The resin layer was obtained and evaluated like Example 86 except having used hydroxypropanesulfonic acid 0.043 weight section and N,N-dimethyl octylamine 0.057 weight section. The result was shown in Table 18.

106]Instead of example 88 camphor sulfonic acid 0.056 weight section, the resin layer was obtained
d evaluated like Example 86 except having used mesitylene sulfonic acid 0.056 weight section. The
ult was shown in Table 18.
107]Instead of example 89 camphor sulfonic acid 0.056 weight section and N,N-dimethyl octylamine
44 weight section, the resin layer was obtained and evaluated like Example 86 except having used
decylbenzenesulfonic acid 0.06 weight section and pyridine 0.02 weight section. The result was
wn in Table 18.
108]Instead of example 90 camphor sulfonic acid 0.056 weight section and N,N-dimethyl octylamine
44 weight section, the resin layer was obtained and evaluated like Example 86 except having used
decylbenzenesulfonic acid 0.061 weight section and p-toluidine 0.039 weight section. The result
s shown in Table 18.
109]Instead of example 91 camphor sulfonic acid 0.056 weight section and N,N-dimethyl octylamine
44 weight section, the resin layer was obtained and evaluated like Example 86 except having used
-cyclohexane 2 acetic-acid 0.048 weight section and dodecyl amine 0.104 weight section. The
ult was shown in Table 18.
110]Instead of example 92 camphor sulfonic acid 0.056 weight section and N,N-dimethyl octylamine
44 weight section, the resin layer was obtained and evaluated like Example 86 except having used
icylic acid 0.042 weight section and dodecyl amine 0.06 weight section. The result was shown in
ble 18.
111]Instead of comparative example 31 camphor sulfonic acid 0.056 weight section and N,N-
ethyl octylamine 0.044 weight section, the resin layer was obtained and evaluated like Example 86
cept having used pyridine 0.1 weight section. The result was shown in Table 18.
112]Instead of comparative example 32 camphor sulfonic acid 0.056 weight section and N,N-
ethyl octylamine 0.044 weight section, the resin layer was obtained and evaluated like Example 86
cept having used salicylic acid 0.1 weight section. The result was shown in Table 18.
113]Instead of comparative example 33 camphor sulfonic acid 0.056 weight section and N,N-
ethyl octylamine 0.044 weight section, the resin layer was obtained and evaluated like Example 86
cept having used camphor sulfone sodium 0.1 weight section. The result was shown in Table 18.
114]Instead of comparative example 34 camphor sulfonic acid 0.056 weight section and N,N-
ethyl octylamine 0.044 weight section, the resin layer was obtained and evaluated like Example 86
cept having used pyridinium chloride 0.1 weight section. The result was shown in Table 18.
15]
ble 18]

	有機酸		アミン		水浸漬24時間後のヘイズ(%)
	種類	添加部数	種類	添加部数	
88	樟脳スルホン酸	0.056	N,N-ジメチルオクチルアミン	0.044	25.7
87	[illegible] 酸	0.043	N,N-ジメチルオクチルアミン	0.057	29.0
88	メシチレンスルホン酸	0.056	N,N-ジメチルオクチルアミン	0.044	20.4
89	ドデシルベンゼンスルホン酸	0.08	ピリジン	0.02	21.4
90	ドデシルベンゼンスルホン酸	0.061	p-トルイジン	0.039	19.8
91	1,1-ジクロヘキサン二酢酸	0.048	ドデシルアミン	0.104	28.9
92	サリチル酸	0.042	ドデシルアミン	0.06	26.1
31	—	—	ピリジン	0.1	46.2
32	サリチル酸	0.1	—	—	35.1
33	樟脳スルホン酸ナトリウム			0.1	66.2
34	塩化ピリジニウム			0.1	54.7

16]Polyvinyl-butyral-resin 100 weight section prepared in example 93 Example 42, Triethylene-
col-di-2-ethyl-butyrate 40 weight section, octanoic acid 0.4 weight section, On the same
nditions as Example 42, it kneaded, press forming of N,N-dimethyl octylamine 0.11 weight section
l the 2-ethylbutanoic acid magnesium 0.037 weight section was carried out, and the 0.8-mm-thick

resin layer was obtained. About the obtained resin layer, the moisture-proof white-blush-mark sex test was done like Example 1.
[0317]The friction test was done by the following method about the glass laminate obtained by fastening the above-mentioned resin layer between the glass plates (4x4 cm) of two sheets, and obtaining a glass laminate. The obtained result was shown in Table 19.
[0318](Friction test) After the glass laminate was immersed in underwater [with a temperature of 60 **] for one week, it dried in oven with a temperature of 80 ** for 4 hours. After repeating the process of this underwater immersion and oven drying 3 times, the existence of exfoliation of the interlayer in the circumference of a glass laminate was checked visually.
[0319]The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except having changed the quantity of example 94 N,N-dimethyl octylamine into 0.28 weight sections.
[0320]The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except having changed the quantity of example 95 octanoic acid into 0.1 weight sections, and having changed the quantity of N,N-dimethyl octylamine into 0.06 weight sections, respectively.
[0321]Change the quantity of example 96 octanoic acid into 0.2 weight sections, and the quantity of N,N-dimethyl octylamine is changed into 0.09 weight sections, respectively, The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except having used 2-ethylhexanoic acid magnesium 0.045 weight section instead of 2-ethylbutanoic acid magnesium 0.037 weight section.
[0322]Change the quantity of example 97 octanoic acid into 0.1 weight sections, and the quantity of N,N-dimethyl octylamine is changed into 0.06 weight sections, respectively, The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except having used 2-ethylhexanoic acid magnesium 0.045 weight section instead of 2-ethylbutanoic acid magnesium 0.037 weight section.
[0323]Except having changed the quantity of example 98 octanoic acid into 0.1 weight sections, and having used decyl amine 0.06 weight section and 2-ethylhexanoic acid magnesium 0.045 weight section instead of N,N-dimethyl octylamine 0.11 weight section and 2-ethylbutanoic acid magnesium 0.037 weight section, The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19.
[0324]Except having used di(2-ethylhexyl) phosphoric acid 0.03 weight section instead of example 99 octanoic-acid 0.4 weight section, and having changed the quantity of N,N-dimethyl octylamine into 0.02 weight sections, The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19.
[0325]using the glass laminate obtained by the comparative example 35 comparative example 12, the result obtained by doing only a friction test like Example 93 was looked like [Table 19], and was shown.
[0326]The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except not having used comparative example 36 octanoic acid and N,N-dimethyl octylamine.
[0327]The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except not having used comparative example 37 N,N-dimethyl octylamine.
[0328]The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except not having used comparative example 38 octanoic acid.
[0329]Comparative example 39 octanoic acid and N,N-dimethyl octylamine are not used. The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except having used 2-ethylhexanoic acid magnesium 0.045 weight section instead of 2-ethylbutanoic acid magnesium 0.037 weight section.
[0330]Instead of comparative example 40 octanoic-acid 0.4 weight section, N,N-dimethyl octylamine 0.11 weight section, and 2-ethylbutanoic acid magnesium 0.037 weight section, The result obtained by performing production and evaluation of a resin layer and a glass laminate like Example 93 was shown in Table 19 except having used octanoic acid 0.2 weight section and 2-ethylhexanoic acid magnesium

45 weight section.
31]Instead of comparative example 41 octanoic-acid 0.4 weight section, N,N-dimethyl octylamine 1 weight section, and 2-ethylbutanoic acid magnesium 0.037 weight section, The result obtained by forming production and evaluation of a resin layer and a glass laminate like Example 93 was shown Table 19 except having used octanoic acid 0.1 weight section and 2-ethylhexanoic acid magnesium 45 weight section.
32]
ible 19]

	有機酸		アミン		有機酸マグネシウム		光線透過率測定後のヘイズ（%）	泡の発生状態
	種類	添加部数	種類	添加部数	種類	添加部数		
93	オクタン酸	0．4	N,N-ジメチルオクチルアミン	0．11	2-エチル酪酸マグネシウム	0.037	24．3	※L
94	オクタン酸	0．4	N,N-ジメチルオクチルアミン	0．28	2-エチル酪酸マグネシウム	0.037	22．5	※L
95	オクタン酸	0．1	N,N-ジメチルオクチルアミン	0．06	2-エチル酪酸マグネシウム	0.037	25．3	※L
96	オクタン酸	0．2	N,N-ジメチルオクチルアミン	0．09	2-エチルヘキサン酸マグネシウム	0.045	18．8	※L
97	オクタン酸	0．1	N,N-ジメチルオクチルアミン	0．05	2-エチルヘキサン酸マグネシウム	0.045	23．8	※L
98	オクタン酸	0．1	ドデシルアミン	0．06	2-エチルヘキサン酸マグネシウム	0.045	18．4	※L
99	ジ(2-エチルヘキシル)リン酸	0．03	N,N-ジメチルオクチルアミン	0．05	2-エチル酪酸マグネシウム	0.037	25．8	※L
95	―	―	―	―	―	―	33．4	※※
96	―	―	―	―	2-エチル酪酸マグネシウム	0.037	38．9	※L
97	オクタン酸	0．4	―	―	2-エチル酪酸マグネシウム	0.037	35．6	※L
98	―	―	N,N-ジメチルオクチルアミン	0．11	2-エチル酪酸マグネシウム	0.037	71．2	※L
99	―	―	―	―	2-エチルヘキサン酸マグネシウム	0.045	35．2	※L
40	オクタン酸	0．2	―	―	2-エチルヘキサン酸マグネシウム	0.045	28．7	※L
41	オクタン酸	0．1	―	―	2-エチルヘキサン酸マグネシウム	0.045	28．9	※L

33]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of onification of 98.9 mol to the preparation pure water 2890g of example 100(1) polyvinyl-acetal in ~~ warming ~~ it dissolved. Temperature control of the system of reaction was carried out to 12 35% of chloride catalysts [201 g of] and the n-butylaldehyde 143g were added, this temperature s held, and the reactant was deposited. Then, hold the system of reaction at 45 ** for 3 hours, ke a reaction complete, superfluous water washes, and unreacted n-butylaldehyde is flushed, The assium hydroxide solution which is a general-purpose neutralizer neutralized the chloride catalyst, l also white powdered polyvinyl butyral resin was obtained through rinsing and desiccation for 2 rs with superfluous water. The amount of 64-mol % and survival acetyl groups of the degree of nation of average butyral of this resin was 1-mol %.
34](2) As opposed to 100 copies of manufacture above-mentioned polyvinyl butyral resin erage-degree-of-polymerization 1700 and amount % of 1 mol of degree % and survival acetyl ups of formation of average butyral of 64 mol) of the interlayer for glass laminates, As a sticizer, 40 copies of triethylene glycol di-2-ethyl butyrate, After having added 0.75 copy of decylbenzenesulfonic acid as organic acid, adding 0.25 copy of dimethyl octylamine as amine and y carrying out melt kneading with a roll mill, with the press-forming machine, press forming was ried out for 30 minutes, and 150 ** of interlayers for glass laminates of 0.76 mm of average ckness were obtained. It was 45 ppm as a result of measuring the kalium content of the obtained erlayer by ICP luminescence ultimate analysis.
35]It was 5 micrometers as a result of measuring the particle diameter of the potassium element ch exists in the interlayer for glass laminates obtained above using time-of-flight type secondary mass spectroscopy (TOF-SIMS).
36](3) It inserts from both sides using the manufacture above-mentioned interlayer of a glass inate with a transparent float glass (30 cm by 30 cmx2.5 mm in thickness). After putting this in in rubber bag and carrying out indirect desulfurization mind with the degree of vacuum of 20torr for minutes, it moved to oven, deaerated, and the vacuum press was carried out, holding for 30 utes at 90 more **. Thus, this adhesion was performed for the glass laminate by which preliminary esion was carried out for 20 minutes on pressure 12 kg/cm^2 and conditions with a temperature of

135 ** in air type autoclave, and the glass laminate was obtained.
[0337](4) About the glass laminate obtained by the evaluation above, the humidity test was done by the following methods. The result was as being shown in Table 20.
[0338]Based on humidity test JIS R-3212 "the safety glass test method for cars", a glass laminate is neglected for two weeks under the atmosphere of 50 **-95%RH.
Then, the distance (white-blush-mark distance) of the milked portion was measured from the circumference of a glass laminate.

[0339]In manufacture of the interlayer for example 101 glass laminates, as organic acid, instead of 0.75 copy of dodecylbenzenesulfonic acid, The interlayer for glass laminates and the glass laminate were obtained like Example 100 except having added 0.30 copy of octanoic acid and having added 0.40 copy of dodecyl amine instead of 0.25 copy of dimethyl octylamine as amine. Kalium content was 49 ppm.
[0340]It was 4 micrometers when the particle diameter of the potassium element which exists in the interlayer for glass laminates obtained above was measured like Example 100.
[0341]In manufacture of the interlayer for example 102 glass laminates, the interlayer for glass laminates and the glass laminate were obtained like Example 100 instead of 0.75 copy of dodecylbenzenesulfonic acid as organic acid except having added 0.20 copy of di(2-ethylhexyl) phosphoric acid. Kalium content was 55 ppm.
[0342]It was 3 micrometers when the particle diameter of the potassium element which exists in the interlayer for glass laminates obtained above was measured like Example 100.
[0343]In manufacture of the interlayer for example 103 glass laminates, the interlayer for glass laminates and the glass laminate were obtained like Example 100 as an adhesives regulator except having added 0.75 copy of potassium stearate. Kalium content was 350 ppm.
[0344]It was 8 micrometers when the particle diameter of the potassium element which exists in the interlayer for glass laminates obtained above was measured like Example 100.
[0345]In manufacture of the interlayer for comparative example 42 glass laminates, the interlayer for glass laminates and the glass laminate were obtained like Example 100 except not having added the organic acid and amine of the dispersing agent. Kalium content was 47 ppm.
[0346]It was 18 micrometers when the particle diameter of the potassium element which exists in the interlayer for glass laminates obtained above was measured like Example 100.
[0347]In manufacture of the interlayer for comparative example 43 glass laminates, the interlayer for glass laminates and the glass laminate were obtained like Example 100 not having added the organic acid and amine of the dispersing agent, and except having changed washing time from 2 hours in 3 hours. Kalium content was 34 ppm.
[0348]It was 12 micrometers when the particle diameter of the potassium element which exists in the interlayer for glass laminates obtained above was measured like Example 100.
[0349]The humidity test of the glass laminate obtained by Examples 101-103 and the comparative examples 42 and 43 was done like Example 100. The result was as being shown in Table 20.
[0350]
[Table 20]

		実施例				比較例	
		100	101	102	103	42	43
中間膜	アセタール化段数	3	4	4	4	4	4
	平均アセタール化度（mol%）	64.0	64.0	64.0	64.0	64.0	64.0
	残存アセチル基量（mol%）	1.0	1.0	1.0	1.0	1.0	1.0
	平均重合度	1700	1700	1700	1700	1700	1700
	可塑剤量（重量部）	40	40	40	40	40	40
	カリウム濃度(ppm)	55	49	55	350	47	34
	カリウム粒径（μm）	5	4	8	8	18	12
耐湿性試験後の端縁からの白化距離（mm）		1.3	1.3	1.2	1.7	3.8	3.8
総合特性		○	○	○	○	×	×

51]The glass laminate of Examples 100-103 by this invention showed the outstanding moisture istance so that clearly from Table 20. On the other hand, the glass laminate of the comparative mples 42 and 43 with the particle diameter of greater than 10 micrometers of the potassium ment which exists in the interlayer for glass laminates had bad moisture resistance.
52]adding the average degree of polymerization 1700, and the degree% of polyvinyl alcohol 275g of onification of 98.9 mol to the preparation pure water 2890g of example 104(1) polyvinyl-acetal in -- warming -- it dissolved. Temperature control of the system of reaction was carried out to 12 35% of chloride catalysts [201 g of] and the n-butylaldehyde 148g were added, this temperature s held, and the reactant was deposited. Then, hold the system of reaction at 45 ** for 3 hours, ke a reaction complete, superfluous water washes, and unreacted n-butylaldehyde is flushed. The lium hydroxide solution which is a general-purpose neutralizer neutralized the chloride catalyst, l also white powdered polyvinyl butyral resin was obtained through rinsing and desiccation for 2 rs with superfluous water. The amount of 64-mol % and survival acetyl groups of the degree of nation of average butyral of this resin was 1-mol %.
53](2) As opposed to 100 copies of manufacture above-mentioned polyvinyl butyral resin erage-degree-of-polymerization 1700 and amount % of 1 mol of degree % and survival acetyl ups of formation of average butyral of 64 mol) of the interlayer for glass laminates, As a sticizer, 40 copies of triethylene glycol di-2-ethyl butyrate, After having added 0.75 copy of lecylbenzenesulfonic acid as organic acid, adding 0.13 copy of dimethyl octylamine as amine and y carrying out melt kneading with a roll mill, with the press-forming machine, press forming was ried out for 30 minutes, and 150 ** of interlayers for glass laminates of 0.76 mm of average ckness were obtained. It was 50 ppm as a result of measuring the sodium content of the obtained rlayer by ICP luminescence ultimate analysis.
54]It was 4 micrometers as a result of measuring the particle diameter of the sodium element ch exists in the interlayer for glass laminates obtained above using time-of-flight type secondary mass spectroscopy (TOF-SIMS).
55](3) It inserts from both sides using the manufacture above-mentioned interlayer of a glass inate with a transparent float glass (30 cm by 30 cmx2.5 mm in thickness). After putting this in in rubber bag and carrying out indirect desulfurization mind with the degree of vacuum of 20torr for minutes, it moved to oven, deaerated, and the vacuum press was carried out, holding for 30 utes at 90 more **. Thus, this adhesion was performed for the glass laminate by which preliminary esion was carried out for 20 minutes on pressure 12 kg/cm^2 and conditions with a temperature of ** in air type autoclave, and the glass laminate was obtained.
56](4) About the glass laminate obtained by the evaluation above, the humidity test was done by same method as Example 100. The result was as being shown in Table 21.
57]In manufacture of the interlayer for example 105 glass laminates, as organic acid, instead of copy of dodecylbenzenesulfonic acid, The interlayer for glass laminates and the glass laminate e obtained like Example 104 except having added 0.30 copy of octanoic acid and having added copy of decyl amine instead of 0.13 copy of dimethyl octylamine as amine. Sodium content was ppm.
58]It was 5 micrometers when the particle diameter of the sodium element which exists in the rlayer for glass laminates obtained above was measured like Example 104.
59]In manufacture of the interlayer for example 106 glass laminates, the interlayer for glass inates and the glass laminate were obtained like Example 104 instead of 0.75 copy of lecylbenzenesulfonic acid as organic acid except having added 0.20 copy of di(2-ethylhexyl) sphoric acid. Sodium content was 40 ppm.
60]It was 2 micrometers when the particle diameter of the sodium element which exists in the rlayer for glass laminates obtained above was measured like Example 100.
61]In manufacture of the interlayer for example 107 glass laminates, the interlayer for glass inates and the glass laminate were obtained like Example 104 as an adhesives regulator except ing added 0.50 copy of sodium stearate. Sodium content was 280 ppm.
62]It was 7 micrometers when the particle diameter of the sodium element which exists in the rlayer for glass laminates obtained above was measured like Example 104.
63]In manufacture of the interlayer for comparative example 44 glass laminates, the interlayer for

glass laminates and the glass laminate were obtained like Example 104 except not having added the organic acid and amine of the dispersing agent. Sodium content was 51 ppm.
[0364]It was 20 micrometers when the particle diameter of the sodium element which exists in the interlayer for glass laminates obtained above was measured like Example 104.
[0365]In manufacture of the interlayer for comparative example 45 glass laminates, the interlayer for glass laminates and the glass laminate were obtained like Example 104 not having added the organic acid and amine of the dispersing agent, and except having changed washing time from 2 hours in 3 hours. Sodium content was 30 ppm.
[0366]It was 13 micrometers when the particle diameter of the sodium element which exists in the interlayer for glass laminates obtained above was measured like Example 104.
[0367]The humidity test of the glass laminate obtained by Examples 105-107 and the comparative examples 44 and 45 was done like Example 104. The result was as being shown in Table 21.
[0368]
[Table 21]

		実施例				比較例	
		104	105	106	107	44	45
中間膜	アセタール化炭素数	4	4	4	4	4	4
	平均アセタール化度（mol%）	64.0	64.0	64.0	64.0	64.0	64.0
	残存アセチル基量（mol%）	1.0	1.0	1.0	1.0	1.0	1.0
	平均重合度	1700	1700	1700	1700	1700	1700
	可塑剤種（炭素数）	40	40	40	40	40	40
	ナトリウム濃度(ppm)	50	45	40	280	51	30
	ナトリウム粒径（μm）	4	5	2	7	20	13
耐湿性試験後の端縁からの白化距離（mm）		1.4	1.4	1.0	1.7	4.2	3.0
総合判定		○	○	○	○	×	×

[0369]The glass laminate of Examples 104-107 by this invention showed the outstanding moisture resistance so that clearly from Table 21. On the other hand, the glass laminate of the comparative examples 44 and 45 with the particle diameter of greater than 10 micrometers of the sodium element which exists in the interlayer for glass laminates had bad moisture resistance.
[0370]
[Effect of the Invention]It consists of above-mentioned composition in this invention.
Therefore, without spoiling basic performance required for glass laminates, such as transparency, weatherability, an adhesive property, and penetration resistance, even when moreover placed into a humid atmosphere, the interlayer for glass laminates and glass laminate with few white blush marks of a glass laminate edge part can be provided.

[Translation done.]

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cisely.
*** shows the word which can not be translated.
the drawings, any words are not translated.

ITTEN AMENDMENT

[Written amendment]

ing date]May 13, Heisei 11
nendment 1]
ocument to be Amended]Specification
m(s) to be Amended]Claim
thod of Amendment]Change
oposed Amendment]
aim(s)]
aim 1]An interlayer for glass laminates when it is an interlayer for glass laminates which consists plasticized polyvinyl polyvinylacetal resin films and said 0.3-0.8-mm-thick interlayer is immersed in ** water, wherein Hayes of 24 hours after is 50% or less.
aim 2]The interlayer for glass laminates according to claim 1 whose particle diameter of sodium in an interlayer is 10 micrometers or less.
aim 3]The interlayer for glass laminates according to claim 1 or 2 whose particle diameter of ium salt in an interlayer is 5 micrometers or less.
aim 4]The interlayer for glass laminates according to claim 1, 2, or 3 whose sodium concentration n interlayer is 50 ppm or less.
aim 5]The interlayer for glass laminates according to claim 1 whose particle diameter of potassium in an interlayer is 10 micrometers or less.
aim 6]The interlayer for glass laminates according to claim 1 or 5 whose particle diameter of assium salt in an interlayer is 5 micrometers or less.
aim 7]The interlayer for glass laminates according to claim 1, 5, or 6 whose potassium ncentration in an interlayer is 100 ppm or less.
aim 8]The interlayer for glass laminates according to claim 1, 2, 3, 4, 5, 6, or 7 which is a thing ntaining a compound which can form sodium salt and potassium salt, and a complex.
aim 9]The interlayer for glass laminates according to claim 1, 2, 3, 4, 5, 6, or 7 which is a thing ntaining amine which is compatible in organic acid which is compatible in resin and a plasticizer, in, and a plasticizer.
aim 10]The interlayer for glass laminates according to claim 1, 2, 3, 4, 5, 6, 7, 8, or 9 which is a g containing at least one sort chosen from a group which consists of alkali metal salt and alkaline th metal salt.
aim 11]The interlayer for glass laminates according to claim 10 whose alkali metal salt is a thing n a particle diameter of 3 micrometers or less and whose alkaline earth metal salt is a thing with a rticle diameter of 3 micrometers or less.
aim 12]The interlayer for glass laminates according to claim 10 or 11 whose alkali metal salt is the li metal salt of organic acid of the carbon numbers 6-16 and whose alkaline earth metal salt is the line earth metal salt of organic acid of the carbon numbers 5-16.
aim 13]A glass laminate characterized by making the interlayer for glass laminates according to m 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12 come to intervene between glass of a couple at least.
aim 14]An interlayer for glass laminates whose particle diameter of sodium salt in an interlayer it is nterlayer for glass laminates which consists of plasticized polyvinyl polyvinylacetal resin films, and 0 micrometers or less.

[Claim 15]An interlayer for glass laminates whose particle diameter of sodium salt in an interlayer it is an interlayer for glass laminates which consists of plasticized polyvinyl polyvinylacetal resin films, and is 5 micrometers or less.
[Claim 16]The interlayer for glass laminates according to claim 14 or 15 whose sodium concentration in an interlayer is 50 ppm or less.
[Claim 17]An interlayer for glass laminates whose sodium concentration in an interlayer it is an interlayer for glass laminates which consists of plasticized polyvinyl polyvinylacetal resin films, and is 50 ppm or less.
[Claim 18]An interlayer for glass laminates whose particle diameter of potassium salt in an interlayer it is an interlayer for glass laminates which consists of plasticized polyvinyl polyvinylacetal resin films, and is 5 micrometers or less.
[Claim 19]An interlayer for glass laminates whose potassium concentration in an interlayer it is an interlayer for glass laminates which consists of plasticized polyvinyl polyvinylacetal resin films, and is 100 ppm or less.
[Claim 20]An interlayer for glass laminates whose potassium concentration in an interlayer it is an interlayer for glass laminates which consists of plasticized polyvinyl polyvinylacetal resin films, particle diameter of potassium salt in an interlayer is 5 micrometers or less, and is 100 ppm or less.
[Claim 21]An interlayer for glass laminates whose potassium concentration in an interlayer it is an interlayer for glass laminates which consists of plasticized polyvinyl polyvinylacetal resin films, sodium concentration in an interlayer is 50 ppm or less, and is 100 ppm or less.
[Claim 22]The interlayer for glass laminates according to claim 14, 15, 16, 17, 18, 19, 20, or 21 which is a thing containing a compound which can form sodium salt and potassium salt, and a complex.
[Claim 23]The interlayer for glass laminates according to claim 14, 15, 16, 17, 18, 19, 20, or 21 which is a thing containing amine which is compatible in organic acid which is compatible in resin and a plasticizer, resin, and a plasticizer.
[Claim 24]The interlayer for glass laminates according to claim 14, 15, 16, 17, 18, 19, 20, 21, 22, or 23 which is a thing containing at least one sort chosen from a group which consists of alkali metal salt and alkaline earth metal salt.
[Claim 25]The interlayer for glass laminates according to claim 24 whose alkali metal salt is a thing with a particle diameter of 3 micrometers or less and whose alkaline earth metal salt is a thing with a particle diameter of 3 micrometers or less.
[Claim 26]The interlayer for glass laminates according to claim 24 or 25 whose alkali metal salt is the alkali metal salt of organic acid of the carbon numbers 5-16 and whose alkaline earth metal salt is the alkaline earth metal salt of organic acid of the carbon numbers 5-16.
[Claim 27]A glass laminate making claims 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, and 25 or an interlayer for glass laminates given in 26 come to intervene between glass of a couple at least.

[Translation done.]